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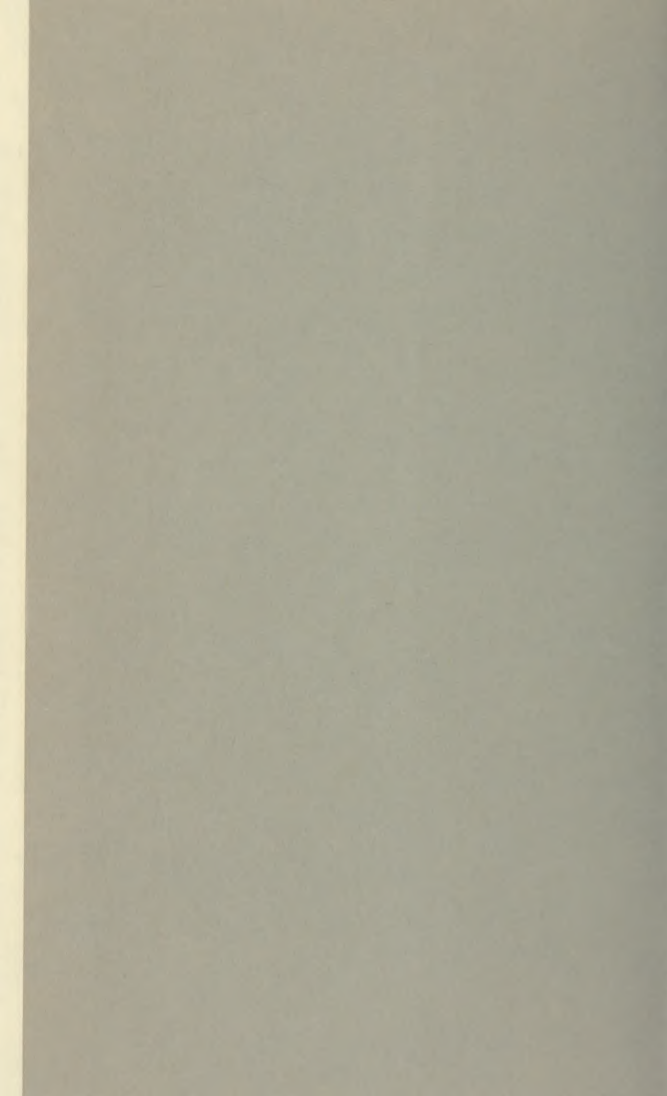
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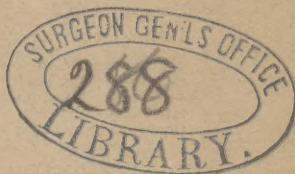
PART I (DOUBLE PART)

THE GENERAL DISEASES, DISEASES
OF THE LUNGS, HEART, BLOOD-
VESSELS, AND LIVER

BY

C. E. ARMAND SEMPLE

B.A., M.B., Cantab.; L.S.A., M.R.C.P., Lond.



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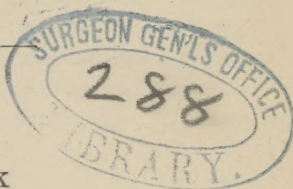
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HALL; AUTHOR OF "AIDS TO CHEMISTRY (INORGANIC AND
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PREFACE.

THE present volume is merely intended as an outline, or rather *skeleton*, of the subject with which it presumes to deal.

The following pages really consist of an abstract of lectures delivered, during many years past, to pupils preparing for the Royal College of Physicians, the Apothecaries' Hall, and other medical examinations, and are published at the suggestion and request of numerous students.

In preparing this, the second edition of 'Aids to Medicine,' Part I., the work has been very carefully revised, almost entirely re-written, and considerably extended ; but, of course, in so limited a space it has only been possible to select the most important facts, to the exclusion of many matters of detail and theory.

Inter alia, the following are the contents of the succeeding parts of 'Aids to Medicine,' viz :

In Part II., The Pathology of the Urine, the Diseases of the Kidneys, Stomach and Throat.

In Part III., The Nervous System.

In Part IV. will be found, the Fevers, Skin Diseases, Worms, etc.

It is hoped that the work will prove useful as an introduction to the study of the Practice of Medicine, and be found serviceable as a refresher to the memory after the large manuals have been carefully gone through.

ARMAND SEMPLE.

8, TORRINGTON SQUARE, W.C.,

October, 1882.

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AIDS TO MEDICINE.

GENERAL DISEASES.

INFLAMMATION (in, in, and flamma, a flame).

PHLOGOSIS (φλόγωσις, a burning).

Varieties.—(1) Acute ; (2) Chronic.

ACUTE INFLAMMATION.

Symptoms.—(1) Local.

(2) Constitutional or General.

Local Symptoms.—When **External**, these are pain, swelling, redness, and heat. The pain is produced by the pressure on the nerves by the surrounding swollen textures ; the swelling and redness arise, the latter from the increased amount of red blood which the vessels of the part contain, the former from the same cause, and from the exudation of serum, lymph and leucocytes from the blood ; it is further increased by the enlargement and proliferation of these leucocytes, and of the connective tissue corpuscles and other cellular elements of the inflamed tissue. The heat never exceeds that of the blood, although it is greater than that of the other superficial and unaffected parts.

When **Internal**, the symptoms are functional disturbance and pain; the former symptom is indicated in secreting organs by alteration, increase, diminution, or entire suppression of the proper secretions; in other organs there are varying conditions of excitement: in the lungs there is dyspnoea; in the ear and eye, intolerance of light and sound; in the heart, palpitation; in the brain, delirium. The pain is increased by pressure in those situations where pressure can be applied, or in milder forms of inflammation, pressure may produce pain in parts where it did not previously exist.

Constitutional or General Symptoms.—These are known collectively under the name of **Inflammatory Fever**. They include thirst, furred tongue, pain in the limbs, back, and head, rigors, languor, and loss of appetite. The pulse is full, rapid or hard—its character, however, differing in different inflammations, being *wiry* (hard, small, and rapid) in serous inflammations and usually *full* and *bounding* in those of mucous and parenchymatous structures—the skin is dry, the urine scanty and high-coloured, and there is constipation. The blood when drawn, is, in certain inflammations, buffed and cupped, *i.e.*, concave with a buff-coloured coating. When the inflammation occurs in unhealthy persons, or when it is severe and extensive, serious symptoms of constitutional irritation are induced, *viz.*, great restlessness, rigors, hurried respiration, a sharp quick pulse, and low muttering delirium; death may occur from exhaustion.

Terminations.—(1) Resolution or cure; (2) Metastasis or change of seat; (3) Effusion of serum; (4) Effusion of lymph; (5) Suppuration or formation of pus; (6) Ulceration; (7) Gangrene, mortification or sphacelus.

Causes.—The sanguine temperament, general weakness, febrile and cachectic conditions (especially the scrofulous), are said to predispose, while as exciting causes may be added, (1) Chemical and mechanical irritants; (2) Heat and cold; (3) Morbid poisons in the blood; (4) Local congestion; and (5) The excitement in the circulation which takes place in fevers.

Modifications in the inflammatory character. These may be due to (1) The texture; and (2) The condition of the system.

(1) **The Texture.**—**Serous** membranes in acute inflammation become the seat of adhesive inflammation, but very rarely of the suppurative; in the **Mucous** membranes inflammation gives rise to the production of pus, increased flow of mucus, and occasionally lymph, and these membranes are liable to suppuration, ulceration, and softening, but rarely to adhesion of their surfaces. The inflammation of the areolar tissue is termed **Phlegmonous**, and induces the secretion of serum, and frequently of lymph and pus, and it very commonly ends in abscess. Among **Fibrous** tissues, ligament and tendon are liable to become gangrenous, and cartilage may ulcerate. The parenchyma of organs may be softened by acute, or hardened by chronic inflammation: or the inflammation may end in abscess or in gangrene. Inflammation of the bones terminates in caries and necrosis. The skin resembles the mucous membranes in its liability to suppuration. In inflammation of the **Serous** membranes there is acute pain, there is an excess of fibrin in the blood, bleeding and depletory measures are usually well borne, and the blood is buffed and cupped, the heat of surface and muscular debility are increased, the frequency of the pulse is accompanied by hardness, and there is sometimes a tendency to delirium. In the

Mucous membranes, on the contrary, the pain is often slight, bleeding and depletion are not well borne, the fibrin in the blood is not increased, and there is no buffed and cupped appearance of that fluid. A certain doubtful resemblance may be observed, however, between the mucous and serous membranes in the formation of those **false membranes** which occur in diphtheria and some allied diseases of the mucous membrane of the lungs and bowels.

The condition of the system.—In **Scarlatina**, the mucous membrane of the pharynx and of the parts in its vicinity is liable to ulceration. In **Measles** there is inflammation similar to that which arises in an ordinary cold, and this inflammation may induce effusion of mucus and pus in the larynx and trachea.

In **Smallpox**, suppuration and gangrene frequently follow the inflammatory action.

Of **Acute Adhesive Inflammation** the indications are : a strong, hard, wiry, and rapid pulse, heat of skin, but no giddiness or headache (unless the membranes of the brain are affected), no alteration in the character of the urine, and bleeding and depletion are well borne.

Suppuration is indicated by sharp, agonising pain, sometimes by repeated rigors succeeded by heat and sweating (**Hectic Fever**). In **Gangrene** the pain often ceases suddenly ; the entire system is in a state of collapse ; the features are sunken, there are pallor and cold clammy sweats, delirium, a dry brown tongue, the pulse is feeble, small, and rapid, and the teeth are covered with sordes (the **Typhous or Hyperpyrexial state**).

Pathology.—From the artificial production of in-

flammation in the lower animals, this process has been found to consist in :—

(1) **Changes in the Blood-Vessels and Circulation.**

(2) **Exudation of Liquor Sanguinis, and Migration of White Blood Corpuscles.**

(3) **Alterations in the Nutrition of the Inflamed Tissue.**

(1) The first results of inflammation set up by irritation of the mesentery (a transparent tissue) is a dilatation of the arteries, followed by the same condition in the veins, and accompanied by an acceleration in the blood-flow, lasting for about twelve hours. Then follows a considerable retardation in the circulation, the dilatation of the vessels still continuing. During this retardation the leucocytes or white blood-corpuscles congregate in the capillaries, and cling to the sides of the vessels.

(2) The blood current passing over the accumulated leucocytes—these by their active movements permeate the vascular walls, and thus enter the surrounding tissues. In their passage button-like elevations appear to spring from the outer walls of the vessel, and these elevations by degrees assume the form of pear-shaped bodies. They then become severed from the wall, and thus complete their passage. The red blood corpuscles at the same time pass through the walls of the blood-vessels, but in far less number, and chiefly through the walls of the capillaries.

The exudation of liquor sanguinis constitutes the so-called **Inflammatory Effusion**. In this a larger amount of fibrin and albumen is contained than in the transudation of simple mechanical congestion, whilst the phosphates and carbonates are also in excess. The large

number of cell structures contained is remarkable, the particular tissue inflamed and the severity of the inflammation occasioning considerable variation in the nature and quality of the effusion.

(3) The nutritive activity of the cellular elements is always increased; cells which ordinarily undergo no change in form or movement send out processes and alter variously in shape. Cell-proliferation is one of the earliest of the nutritive changes.

The process of **suppuration** is a frequent result of inflammation, and it may be broadly stated that according to the intensity of the inflammation so is the abundant formation of the pus.

Pus is essentially composed of a liquid almost identical with liquor sanguinis, and holding cells suspended in it. This liquid also contains albumen, pyin, chondrin, fatty matters, and inorganic substances. The pus corpuscles closely resemble the white globules of the blood, but they are somewhat rougher in outline, and contain more nuclei, although some authors believe them to be identical. They are spherical, semi-transparent, and vary from $\frac{1}{2500}$ to $\frac{1}{3500}$ of an inch in diameter. The addition of acetic acid causes the cells to swell up, increasing their transparency, and rendering the nuclei more visible. The pus corpuscles are derived either from the blood (leucocytes) or from the cells of the inflamed tissue, and the suspending liquid is undoubtedly the liquor sanguinis.

Treatment.—In **Acute** inflammation the remedies are either **general** or **local**.

The **General** remedies are blood-letting, purging, tartarated antimony, and mercurial preparations, and in slight cases saline aperients are generally useful.

The **Local** remedies are leeches, scarification, and cup-

ping, free incisions of the parts affected, fomentations, poultices, and counter-irritants. Nitrate of silver and perchloride of iron are much employed in the treatment of exposed mucous surfaces.

CHRONIC INFLAMMATION.

This differs from the acute form in the lower degree of the severity of the irritation occasioning it, and in the duration of its action being in general much more prolonged. The exudation of liquor sanguinis and blood corpuscles is not so abundant, and the tendency is eventually to produce an increase of the connective tissue in the part; the redness is more dusky in tint, the pain is sometimes very slight, and the heat of a mild character—an exception to this is, however, observed in the painful joints of chronic rheumatism. When the internal parts are affected, the secretions are performed languidly, and the quantity of the secretion is diminished. Should the areolar tissue be the seat, serous effusions are the usual result.

When inflammation is the result of an injury, it is termed **Traumatic**; when it is due to septic influences, as in pyæmia and tuberculosis, it is called **Infective**; when the cause is not apparent, the name of **Idiopathic** is given; and as **Specific** inflammations may be instanced the “rash” of small-pox, the inflammation of the skin and mucous membranes in syphilis, and the inflammation of the intestinal structures in typhoid fever.

In the **Treatment** of **Chronic** inflammation, local remedies are chiefly of use. These may comprise leeches and cupping, or such alteratives as iodine, etc., but internal remedies, as tonics and cod-liver oil, are also very beneficial.

DROPSY. HYDROPS (ὑδρωψ fr. ὕδωρ water).

ANASARCA (ἀνά through σὰρξ the flesh).

Definition.—Effusion of serum in the areolar tissue, and sometimes into serous cavities.

Local effusions into the areolar tissue are known by the term **Œdema**, whilst to effusions into the different cavities of the body the following names are applied, viz.:

Hydrocephalus (effusion in the head).

Hydrothorax (effusion in the pleura).

Hydropericardium (effusion in the pericardium).

Ascites (effusion into the peritoneum).

Hydrocele (effusion in the tunica vaginalis).

Varieties.—(1) The Dropsy of Debility; (2) Febrile; (3) Renal; and (4) Conditions producing obstruction to the return of blood through the veins, such as is observed in certain cardiac, hepatic and pulmonary affections.

Symptoms of Anasarca.—The first indications are usually a swelling of the feet and ankles, or of the face, the site varying with the cause. The parts affected *pit* on pressure. The skin is cold, dry, and pallid, and if there be much effusion the surface is tense and shining. After a time the effusion oozes at different points, and the surrounding skin becomes excoriated, or small blisters are formed, and sloughing may take place.

Causes and Diagnosis.—Purely local dropsy may depend upon **mechanical obstruction** of some large vein; thus the pressure of a tumour upon the descending vena cava may produce œdema of the head, neck, and upper extremities. The dropsy of debility may

be recognised by the absence of the causes of other forms of dropsy.

Febrile dropsy may be known by the history of previous exposure to cold.

Pulmonary dropsy may supervene upon acute bronchitis, or when the lung has become solidified by tubercle or cancer.

Cardiac dropsy commences in the feet, and may be caused by disease of the valves of the heart, inducing regurgitation of blood and the consequent congestion of the venous system by the obstruction of the venous blood in its passage to the lungs.

Renal dropsy commences in the face, and can be recognised by the condition of the urine, and the absence of serious pulmonary and cardiac symptoms.

The **Treatment** will, of course, depend upon the particular dropsy, and will be described in its appropriate place.

HYPERÆMIA (ὑπερ, excess, αἷμα, blood).

Definition.—An excess of blood in the system.

Divisions.—(1) General. (2) Local (congestions).

Symptoms.—A general florid appearance, with injection of the capillaries of the surface of the body. The lips are red, and the conjunctivæ injected. The bowels are usually confined, the skin is dry and perspiring freely on exertion, the pulse firm, full and bounding. In strongly marked cases the pulse may be irregular and the extremities cold, there may be giddiness, spots before the eyes, severe headache, and noises in the ears.

Terminations. — Hæmorrhages, local congestions, and inflammations; gout, cardiac hypertrophy, and apoplexy.

Causes. — A certain configuration of the body, a short neck and large chest, excessive indulgence in eating and drinking, sedentary habits; in women the suppression of the catamenia.

Varieties of Local Hyperæmia are :

(1.) **Active or Arterial**, in which the arteries are dilated, a greater supply of blood being thus distributed through the parts, and so forming an important element in the commencement of sthenic inflammations.

(2.) **Passive or Capillary.** — Here the capillaries are chiefly involved; a condition leading to atrophic and degenerative changes in tissues which may become the seat of asthenic and chronic inflammations.

(3.) **Mechanical or Venous.** — In this form there is no excessive supply of blood, but merely a difficulty in the escape of this fluid.

Treatment. — A spare diet and regular exercise, together with the frequent use of saline aperients, as the sulphates of soda and magnesia, and also occasionally of calomel and colocynth; bleeding in some form may also be found of service, and indeed in some cases is absolutely necessary.

ANÆMIA (ἀν priv. αἷμα, blood).

Definition. — A diminution in the amount of blood in the system, or rather of its red particles.

Varieties. — (1) Anæmia induced by the direct loss of blood; (2) Chronic Anæmia; (3) Chlorosis.

Symptoms.—The first variety may be well illustrated by the condition called **Syncope**; in this there are giddiness, loss of consciousness, the pulse and heart-beats are hardly perceptible; the surface is covered with perspiration; there is extreme pallor of the gums, face, lips, and skin.

Chronic Anæmia comes on gradually, lasts for a considerable time, and is produced by diminution of the red corpuscles. The skin, gums, lining membrane of the mouth, and the conjunctivæ, are universally pale. The extremities are cold, and fainting fits are not uncommon. The pulse is small and quick, and there is palpitation upon the least exertion. The slightest noise produces agitation, and depression of spirits is a common symptom.

Upon auscultation over the large veins of the neck, a venous murmur (**bruit de diable**) may frequently be heard, and by slight pressure upon the large arteries a blowing sound or **bruit de soufflet** is produced: this is of variable intensity, and may be either soft or harsh.

Causes of Chronic Anæmia.—This disease is of rare occurrence in the male sex, and is generally caused by overwork, or working in dark or ill-ventilated rooms. It is usually connected in females with disturbances in the function of menstruation.

Treatment.—Generous diet, outdoor exercise, change of air, and the employment of chalybeate waters; but of chief importance is the exhibition of the various preparations of iron. For the anæmia connected with amenorrhœa aloetic purgatives combined with iron are chiefly to be relied upon.

CHLOROSIS, or GREEN SICKNESS ($\chi\lambda\omega\rho\acute{o}\varsigma$, green), is almost peculiar to the female sex, and is characterised by a peculiar greenish-yellow colour of the skin. The least exertion produces fatigue, the heart palpitates, the breath is short, there is pain in the back and loins, the breath is offensive, and the bowels are disordered; a peculiar depravity of the appetite is not uncommon, the usual food being rejected, and chalk, and lime, and other similar substances are greedily eaten. Hysteria and Amenorrhœa are common accompaniments.

The **Treatment** will be the same as that of Chronic Anæmia.

A **Progressive Pernicious Anæmia** has been lately described, in which it is stated that in addition to the ordinary symptoms of anæmia there are peculiar changes in the blood, and a tendency to hæmorrhage and dropsy. It is closely associated with extreme cachexia, and steadily advances to a fatal issue.

CARCINOMA.—CANCER ($\kappa\alpha\rho\chi\iota\nu\omicron\varsigma$, a crab).

Description.—All true cancers are *clinically* highly malignant, *i.e.* they increase in size by infiltrating with cells and destroying the surrounding tissues, and tend to recur locally after their removal and reproduce themselves in the internal organs and lymphatic glands.

Varieties.—These are four in number :

- (1) Scirrhus, Chronic or Hard.
- (2) Encephaloid, Medullary, Acute or Soft.
- (3) Epithelioma, Canceroid, or Epithelial.
- (4) Colloid, Alveolar, or Gelatiniform.

All the cancers resemble one another in consisting of

variously shaped cells, enveloped in a fibrous stroma without intercellular substance. The cells are large, and exhibit great diversity of form, being polygonal, round, oval, caudate, or fusiform. They vary in size from $\frac{1}{800}$ to $\frac{1}{1500}$ of an inch in diameter, and contain large prominent nuclei inclosing bright nucleoli.

There is no *specific* cancer-cell, since cells exactly similar to the above are observed in other tissues, normal or morbid, but their general nature, and their distribution in a fibrous stroma determine their cancerous character. A juice exudes from the cut surface. The stroma varies in amount in different forms of cancer; if the growth be rapid, the stroma will contain numerous round, or fusiform cells; if it be slow, but few cells are exhibited, and the tissue is fibrous and dense.

Blood-vessels are contained within the stroma, but these never encroach upon the alveoli in which the cells are contained. Lymphatics also accompany the blood-vessels, and these, communicating with the alveoli, may in a measure account for the tendency of cancer to involve the lymphatic glands. With regard to the development of cancer, many authors consider the epithelial cells to originate only from pre-existing epithelium, whilst others declare that they may originate from the cells of connective tissue, or from migrated white corpuscles. But it appears reasonable to admit that both origins may be correct, and that where the epithelium is the source, the cells are more strictly epithelial, as in epithelioma, and when the connective tissue is the origin, the epithelial characters are less observable, as in Eucephaloid and Scirrhus.

The stroma is partly made up of the connective tissue of the seat of the cancer, and is in part a new growth.

Of the **Secondary Changes**, fatty degeneration is the most important, and this always occurs in greater or less degree in all the cancerous varieties. Caseation, pigmentation, cancrroid, and colloid degeneration may also occur, but calcification is very rare.

The terms **Osteoid**, **Chondroid**, **Cystic**, **Villous**, and **Fungoid** have been applied to cancers presenting certain peculiarities of appearance and structure, and the name of **Melanosis**, or **black-pigment cancer**, has been given to a cancer in which large quantities of pigment are contained. This form is most common in Encephaloid.

SCIRRHOUS CANCER (σκίρρος, hard).

This variety is characterised by the chronicity of its growth, and the large amount of its stroma. The epithelial growth quickly subsides, although at first it may be abundant. The stroma becomes indurated and contracted, and takes on the character of cicatricial tissue. The central portion of the growth may consist eventually of dense fibrous tissue, epithelial structure being only observed at the circumference. On section in scirrhus a white glistening surface is presented, with fibrous bands intersecting. The external portions are less firm than the central, and upon scraping these they exude a juice abounding in granules, nuclei, and cells. The exudation of this juice is very characteristic of cancer. The most common seats of scirrhus are the female breast and the alimentary canal, particularly the rectum, pylorus, and œsophagus.

ENCEPHALOID (ἐγκέφαλος, the brain, εἶδος, like).

This cancer differs from scirrhus in the greater rapidity of its growth, the smaller amount of its stroma, and its

softness of consistence. There are all intermediate stages between scirrhus and encephaloid, so that these can hardly be considered as distinct varieties of cancer, their only distinction being the rapidity of their growth, and their physical characters. In encephaloid the epithelial growth is rapid and luxuriant, the cells soon becoming fatty. The stroma in proportion is very small, does not undergo cicatricial contraction, and is less fibrous than in scirrhus. Hæmorrhage readily takes place from the abundance of the blood-vessels, and the softness and non-resistance of the tissues supporting them. Hence the formation of a bleeding mass called **Fungus Hæmatodes**.

This form of cancer is of brain-like consistence, the central portions being frequently completely diffuent; on section a white pulpy mass is observed, often stained with extravasated blood.

Encephaloid cancer occurs primarily in the articular ends of bones, the uterus, the testis, the eye, and elsewhere, and it is very commonly met with in internal organs as a secondary growth.

EPITHELIOMA (Epithelium, ἐπί, upon, θήλη, the teat).

This form differs from the preceding in always growing in connexion with cutaneous or mucous surfaces, and in its epithelial elements bearing a close resemblance to squamous epithelium. The cells are peculiarly arranged, most of them being situated in irregular tubular-shaped lobules. As the cells increase in number they become grouped concentrically, forming globular masses, and as multiplication of the epithelium takes place, the peripheral cells become flattened by the pressure of the

surrounding structures, the central cells remaining more or less spherical in shape. Thus are formed the **epithelial nests** or **concentric globes**, so characteristic of epithelioma. The stroma may be very abundant or wanting entirely.

The first appearance presented by Epithelioma is as a foul ulcer with indurated edges, or as a sub-cutaneous nodule which eventually suppurates. On section of the tumour a greyish-white granular surface is presented, with lines of fibrous tissue intersecting. Upon pressing the cut surface turbid fluid exudes, and in general a thick curdy material is yielded, coming out in a worm-like shape. This consists of epithelial scales, and upon mixture with water it separates into small visible particles, but does not diffuse like other cancerous juices. This form of cancer seems in many cases to be due to some external irritation. It is often found on the lower lip (at the junction of the mucous membrane with the skin) on the prepuce, scrotum (chimney sweep's cancer) the tongue, labia, cheeks, eyelids, the bladder, and in the cervix uteri, in which it constitutes the so-called Cauliflower excrescence. By its extension any tissue may become involved, viz., muscle, bone, tendon, and lymphatic glands. It is very rare in internal organs.

COLLOID CANCER (κόλλα, glue, εἶδος, like).

Although this is often described as a distinct variety of cancer, it is probably only one of the preceding forms which have undergone a colloid or mucoid change. In colloid cancer the alveoli are large, and more or less spherical, and contain within them a gelatinous or colloid substance which is translucent, colourless, or

yellow, and of a thin mucilaginous consistence. Within this colloid substance are contained epithelioid cells, which in their turn contain a similar colloid material. The most frequent seat of colloid is in the peritoneum, stomach and intestines.

Of all the cancers the least malignant is epithelioma; here local extension takes place, and the lymphatics may be involved, but reproduction in the internal organs rarely takes place. Encephaloid and scirrhus present very different degrees of malignancy; the former being far more rapidly disseminated than the latter, in consequence of its greater rapidity of growth and its greater vascularity; both these forms are reproduced in the lymphatic glands and internal organs.

Colloid bears a close resemblance to encephaloid in its degree of malignancy, and in the rapidity of its development.

In all cancers the secondary growth is apt to repeat the characters of the primary one. This is most observable in colloid, epithelioma, and encephaloid. In scirrhus, the secondary growths in internal organs are usually different to the primary one. They are vascular and soft, and exhibit the characters of encephaloid. But in some cases the different varieties of cancer may replace one another.

The symptoms of cancerous disease vary according to the organs attacked, and will be considered in describing these various organs.

SARCOMATA (σάρξ, flesh).

Description. — Sarcomatous tumours consist of embryonic connective tissue, and retain that embryonic

type throughout the whole of their growth. Amongst them are included the so called **Fibro-plastic**, **Fibro-nucleated**, **Recurrent-fibroid**, and **Myeloid Tumours**.

Cells constitute nearly the whole of the growth, and present great variety of shape and form. The chief varieties are three in number, viz. : (1) The **Round** ; (2) the **Fusiform** ; and (3) the **Myeloid Cells**.

Many of the **Round Cells** are identical with white blood-corpuscles or lymphatic cells, whilst others are larger, present an indistinct nucleus with bright nucleoli, and closely resemble the granulation cells. The **Spindle-Shaped**, **Fusiform**, or "**Fibro-plastic**" cells are long and narrow, and at each end terminate in a fine prolongation ; they usually contain an oval nucleus, with or without nucleoli, and exhibit a higher stage of development than the round cells.

The **Mother** or **Myeloid Cells** are much larger than the two preceding varieties, and are analogous to the cells found in the inflamed medulla of bone. Their shape is very irregular, and they often have numerous off-shoots ; they contain many round or oval nuclei with bright nucleoli.

All the sarcomata possess an **intercellular** substance (usually very small in amount), and their blood-vessels are very numerous. They always originate from connective tissue, and their growth takes place in two ways, viz., by :

- (1) A **central growth**, from multiplication of their own elements ;
- (2) A **peripheral growth**, by the continuous invasion of their matrix.

The peripheral growth is very characteristic of the sarcomata.

These morbid growths rarely implicate other tissues

indiscriminately, but they usually merely displace them, and cause them to atrophy by their pressure.

Secondary Changes.—Amongst the secondary changes the most important is fatty degeneration; but calcification, ossification, and mucoid degeneration are not uncommon.

Varieties of the Sarcomata.—From the different varieties of the cells, the following are known:

(1) Round-celled Sarcoma; (2) Spindle-shaped Sarcoma, or Fibro-plastic Tumour; (3) Myeloid Sarcoma; and from the various secondary changes also (4) Osteoid Sarcoma, (5) Melanotic, and (6) Cystic Sarcoma are described. Glioma is the name applied to a variety of the round-celled Sarcoma growing from the “neuroglia,” or connective tissue of nerve.

Clinically Sarcomatous tumours may be considered as semi-malignant.

Histologically they differ from cancers in the fact that the cells are not grouped in alveoli, but are intimately mixed with the fibrous stroma.

AMYLOID DEGENERATION.

(ἄμυλον, starch; εἶδος, like.)

This process consists in the infiltration of the tissues by a peculiar morbid substance, the exact nature of which is even now not satisfactorily understood. Virchow gave to the new substance the name of

“Amyloid,” since he supposed it to be analogous to starch. It was at one time known under the name of

“Lardaceous,” since the infiltrated organs somewhat resemble *Lard* or *bacon*. Hughes Bennett considered the new material to be a derivative of albumen, and therefore termed it

“Albuminoid.” But Dickinson, after numerous

experiments, considers it to be fibrin deprived of its alkali potash, and he therefore designates it

“**De-alkalized Fibrin,**” and from its association with purulent discharges in which the potash is removed, he calls the condition, “**Depurative Infiltration.**”

It is never a primary affection, but appears to be allied to certain cachectic states. In chronic diseases of bone, empyema, chronic phthisis, chronic pyelitis, and syphilis, where suppuration is prolonged and profuse, the amyloid change is most frequently observed. Syphilis appears to take an active part in the causation, apart from the suppuration so often produced by its various lesions. Every tissue and organ may be the seat of the change, but it is most prone to attack the liver, spleen, kidneys, and lymphatic glands. It may, however, be found in the stomach and intestines, in the œsophagus and pharynx, in the supra-renal capsules, in the bladder, prostate, and organs of generation, in the serous membranes, in the membranes of the brain, in which at times it forms small tumours, in the spinal cord, and in muscle. From the mucous membranes, *e.g.*, the intestines, the exudation of lardaceous matter appears to pass off as a secretion, *viz.*, by diarrhoea and vomiting. It is usual to find several organs simultaneously the seat of the change.

The amyloid material appears first in the walls of the capillaries and small arteries, and then involves the surrounding tissues, both cells and intercellular substance are invaded, and the whole organ may eventually become infiltrated. As the cells become filled with amyloid substance, they gradually increase in size, their contour becomes less irregular, the nuclei disappear, and the cells themselves become converted into a

structureless substance peculiarly translucent and shining. Many of the cells may coalesce, thus losing their distinctive boundaries. The organs affected by the change are usually increased in size ; their absolute weight and specific gravity are increased. The surface is smooth, and the capsule tense. The consistence is somewhat elastic. A glistening translucent appearance like wax is observed on section.

The function and nutrition of the affected organs are gradually impaired, the cells undergo atrophy, and become fatty ; the vitality of the cellular elements is diminished, and their functions may be altogether arrested.

Tests.—(1) When an aqueous solution of **Iodine** (to which some **Iodide of Potassium** is added) is applied to an amyloid organ, the morbid deposit acquires a deep **reddish-brown** colour. This gradually passes off, and the former appearance is regained.

(2) By cautiously adding some **Sulphuric Acid** after the application of the **Iodine**, a **violet** or **blackish-blue** tint is obtained. Many objections are raised by some authors to this latter test, but the reaction with iodine alone is thoroughly characteristic, and is admitted by all writers.

(3) **Methyl-Aniline** gives with the amyloid material a **deep-violet stain**, which is more permanent than the reddish-brown stain given by iodine.

TUBERCLE (Tuberculum, a little tuber).

Under this term are included certain morbid products. The affections characterised by the presence of these products are known collectively under the name of **Tuberculosis**, viz., **Pulmonary Tuberculosis** and **Tuber-**

culosis of the mesentery ; but the lungs are the most common seat selected by the tubercular deposit.

Two Varieties of tubercle are usually described :

(1) The **Grey Miliary Tubercle**, or **Grey Granulation**.

(2) The **Yellow**, or **Crude Tubercle**.

The **miliary tubercle** is of a grey colour, translucent, and varies in size from a millet-seed to a hemp-seed :

It may be either hard or soft.

The **yellow tubercle** is larger than the grey, softer, and more irregular in outline, less defined, and often merging insensibly into the surrounding tissue. Many of these yellow tubercles have a greyish white, translucent margin, which may be moderately firm, while in the centre they are opaque, yellowish, or caseous.

Collections of these tubercles may be found in the liver, spleen, and other parts, and in the peritoneum and cerebral meninges they give rise to tubercular peritonitis and tubercular meningitis respectively.

Under the microscope the most characteristic appearance is the large multinuclear, so-called giant cell, from which numerous branching fibrillary processes extend in all directions, intimately interlacing, the mesh-work thus formed being filled with small cells identical with those of lymphatic or granulation tissue. A collection of such systems constitutes the tubercle as seen by the naked eye ; it is, however, only in certain tubercles which have developed slowly that the giant cell is found, *i.e.*, when the "*tubercular process*" is of slight intensity. In more rapidly developed tubercle the structure is less definite. In this case the lymphoid cells are found, with other cells of various descriptions, according to the tissue affected ; thus, in the lungs is found the epithelium of the air-cells.

It cannot be said that there is any absolute microscopical distinction between the grey and yellow forms of tubercle.

The most recent view entertained of tubercle is that it is an inflammatory growth of an infective nature, produced by the irritation of particles derived from some morbid focus (most commonly a product of scrofulous inflammation), and conveyed by the vessels and lymphatics.

Virchow considers the tubercular product as a neoplasm due to the proliferation of the connective tissue-cells. Bayle supposes the grey tubercles to remain unchanged for an indefinite period, but the latest microscopical researches seem to show that they eventually become opaque and soften, being infiltrated with fatty and granular matters.

The grey and yellow tubercle may both undergo absorption, the affection being known as *retrogressive*, and the deposits of carbonate and phosphate of lime which sometimes take place in the latter variety have given rise to the name of **obsolete tubercle**, the process itself being termed calcification or cretification.

Laennec considered the grey and yellow forms to be the same substance, and that the yellow was merely a progressive stage of the grey. Virchow considers the grey tubercle as the only true tuberculous product, and regards the yellow tubercle as the result of a degenerative change of different morbid products, including the grey tubercle; that it consists chiefly of the products of inflammation, which have undergone a cheesy metamorphosis, and that in some cases the so-called yellow tubercle simply consists of inspissated pus. In the greater number of cases of "chronic pulmonary tuberculosis," the disease is probably only chronic pneumonia

supervening upon the production of the grey miliary granulations, and it is supposed that the pneumonia may take place without the granulations, just as the latter are not always followed by the former.

It may be confidently asserted that whatever may be the relation between the two products known under the name of tubercle, they must both be considered as the expression of a morbid constitutional condition; *i.e.*, they are the manifestation of a tuberculous cachexia.

Tubercle can be easily produced in many of the lower animals, not only by inoculation but in other ways, and not necessarily by the introduction of tubercle itself, but by other morbid substances.

SCROFULA (scrofa, a pig).

The scrofulous diathesis chiefly occurs in children after infancy, and is characterised by its close resemblance to tubercle; it is said to be indicated by enlargement of the head, swelling of the abdomen, tumefaction of the nose and upper lip, and laxity of the muscles. Cutaneous diseases, as eczema, impetigo, and lupus, chronic suppuration of joints (white swelling), caries and necrosis of the bones, and chronic inflammation of the intestines, may perhaps be regarded as local expressions of the scrofulous diathesis; however, it is certain that these various affections are not unfrequently observed where the glands of the neck are unaffected, and, on the other hand, the glands are often the seat of scrofula when the other so-called scrofulous affections do not exist.

The term, in a restricted sense, implies an affection of the lymphatic glands, especially the superficial ones of the neck. The affected glands always become more

or less enlarged by inflammatory products which may remain quiescent for an indefinite period, and may be removed by absorption ; but when absorption does not take place, softening may occur with but little inflammation ; the integument ulcerates, and there is discharge of the liquefied product, and finally, after a variable period, an irregular puckered characteristic scar results from the cicatrisation of the parts.

The scrofulous products, like the tuberculous, may become cheesy, or become the seat of cretification (deposit of carbonate and phosphate of lime).

RACHITIS. RICKETS.

Definition.—Distortion of the bones, occurring in infancy and childhood, from deficiency of earthy matters, especially lime salts.

Causes. *Predisposing.*—Hereditary predisposition ; a peculiar diathesis, probably allied to the scrofulous, but differing from it, since it is not associated with tuberculous deposits in the lungs, or with enlargements of the cervical glands.

Exciting.—Want of cleanliness, bad food, bad air, and bad nursing.

Symptoms.—The rickety condition may begin soon after birth, often at five or six months old, but usually before the end of the second year, after which time it is very rare. At the commencement of the disease the child appears weakly, the body is emaciated, teething is late and slow in progress, the teeth becoming carious and loose. There is sweating of the head and general hyperæsthesia ; the fontanelles and sutures are usually open, the head large in proportion to the face, the chest flattened at the side, the sternum projecting (pigeon-breast), and beading of the ribs at their

junction with the costal cartilages ; the epiphyses of the long bones become spongy, and the joints swell ; the enlargement of the joints is usually first apparent in the ankles and wrist. By degrees the long bones yield to the weight of the body, and by the action of their muscles they become twisted ; the pelvis is narrowed and distorted, and the spine becomes curved. If walking has been accomplished, the gait is waddling. The mental faculties are often unimpaired, and even more acute than usual. The spleen is often enlarged. The disease is rarely fatal. Recovery often takes place in mild cases, the joints gradually acquiring their natural size ; but in severe cases the distortion becomes permanent and produces hideous deformity.

Pathology.—There is a deficiency of earthy matter, as carbonate and phosphate of lime, occasioned by defective nourishment or mal-assimilation of the food.

Under the microscope, rachitic bone presents characteristic appearances. It is composed of isolated masses of unaltered cartilage, and of the promiscuous distribution of completely or incompletely formed bone. The enlarged cartilage-cells are converted into lacunæ through the imperfect ossification of the matrix.

Treatment.—The general health should be improved by means of good food, fresh and pure air, extreme cleanliness, and sea-bathing ; also by tonics, especially iron preparations, cod-liver oil, and a country life ; the bowels should also be carefully attended to. To supply the deficiency of lime-salts, phosphate of lime, phosphate of ammonia, and lime-water should be exhibited. The latter, with cod-liver oil, or milk and lime water, are especially useful.

The distorted limbs should be supported with padded splints or other mechanical contrivances, not interfering with the action of the muscles, care being taken not to permit the weight of the body to rest on the parts exhibiting a tendency to bend or swell.

FATTY DEGENERATION.

In this condition the normal substance of the tissues is *replaced* by fat; the muscles are especially prone to the change, as is more especially observed in the heart, in which the characters of the muscular fibres are either impaired or lost. The tissues become proportionally softened, and there is a liability to rupture. The affected parts present a yellowish or tawny appearance, and the proper function of the structure is impaired.

Fatty Growth or Infiltration must not be confounded with fatty degeneration, since the former merely consists in an increase of the adipose tissue of the whole or a part of the body, while in the latter the adipose tissue replaces the normal elements of the affected part.

Thus fatty degeneration may take place in the fibres of the voluntary muscles as a result of protracted disease, and a similar condition of the arterial coats, especially those of the minute cerebral arteries, is not uncommon in middle life and in aged persons: the vessels yield, hæmorrhage occurs, and apoplexy or hemiplegia may result. In the fatty kidney the fat is deposited within the cells of the convoluted tubes; and in the like condition of the liver, fat may replace the hepatic cells. It is stated that cancer may undergo retrogression and cure by a fatty change. Persons of advanced age show

fatty degeneration around the cornea (*arcus senilis*), but this is not now held as reliable evidence of the fatty change in any other organ.

In the heart, the power of the organ to carry on the circulation is impaired in proportion to the amount of the degeneration.

Fatty degeneration of certain tissues may occur in lean as well as in obese persons. The fatty liver is sometimes met with in persons who have died of phthisis, especially females, and is also one of the results of alcoholic abuse.

ATHEROMA (*ἀθήρα*, pap)

Is a term signifying pulp or pap, and is a variety of fatty degeneration; it especially affects the valves of the heart and the larger arteries, and consists primarily of a deposit beneath the lining membrane of the arteries or the valves, of a substance of a yellowish or white colour and creamy consistence. Microscopically it is composed of fatty granules, cholesterin crystals, and earthy constituents. A softening of the delicate membrane beneath which it is situated may ensue, and in this manner aneurismal dilatation of the arteries may take place. In the valves of the heart, rupture may occur, involving serious valvular obstruction or incompetence. Atheromatous deposit often becomes calcareous, leading to calcification of the valves.

CALCAREOUS DEGENERATION.

This condition is due to the deposition of earthy salts, especially of phosphate of lime and magnesia, and carbonate of lime. It is known as calcareous degeneration, calcification, or cretification. It is gene-

rally preceded by atheroma, and presents no bony structure (although it was once called ossification), but simply consists of earthy salts. *Gangrena senilis* is often attributable to obstruction to the circulation from calcareous degeneration of the arteries of the lower extremities, and apoplexy and hemiplegia are often occasioned by this degeneration.

The serous membranes may, in rare cases, present plates of bony substance; in old pleurisy the pleura has become so hard and calcareous that it has been removed entire, retaining the form of a solid box; cancer and tubercle may both be the seat of calcareous change, which is also very common in the walls of hydatid cysts.

RHEUMATISM (*ῥέυμα*, a fluxion).

Definition. — This term denotes a constitutional disease characterised by local manifestations situated in the articulations and fibrous tissues.

Varieties :

- (1) Acute Articular Rheumatism, Acute Rheumatic Arthritis or Rheumatic Fever.
- (2) Sub-acute or Chronic Rheumatism.
- (3) Muscular Rheumatism.
- (4) Rheumatic Gout.

ACUTE ARTICULAR RHEUMATISM.

Symptoms. — There is high fever; the pulse is very full and strong, and may reach 120 per minute, and the temperature usually fluctuates between 102° and 110° Fahr. There is urgent thirst. The appetite is entirely lost or greatly impaired. The tongue is coated

with white fur; the saliva is acid; the bowels are usually constipated. The urine is diminished in quantity; its specific gravity is high, since the quantity of urea is increased and the water diminished, the colouring matter is increased, and the urates are abundantly deposited on cooling, the chlorides are sometimes deficient, and there may at times be a slight amount of albumen. There is a notable increase of fibrin in the blood; wakefulness is very troublesome, and delirium is not unfrequent. The skin is covered with *acid sweat*; miliary vesicles often appear upon the neck and trunk. The Local symptoms are as follows: There is swelling of the joints (usually the larger joints) accompanied by heat, tenderness, redness, and pain. The pain is increased by the slightest movement, and pressure is very painful. The swelling is most noticeable in the knee, the wrist, the elbow, and the ankle.

The Duration of the disease varies considerably, and may last from seven days to as many weeks, but it usually runs a course of about six weeks. The lining membrane of the joints is inflamed, but there is rarely any exudation of lymph or pus.

Although rheumatism exhibits great irregularity in regard to the number of joints affected, still the local phenomena obey the law of parallelism; corresponding joints are often affected together, or if this is not the case, the several joints affected are either on one side of the body, or joints on the two sides which are symmetrical, as for instance the knee and elbow, are affected in combination. It is therefore a *bilateral* disease. The great peculiarity of rheumatic inflammation is the tendency to what has been called *metastasis*, or change of seat; thus the inflammation may suddenly abandon

one joint and reappear in another, and then subsequently return to its original situation.

Complications.—In acute rheumatism there is a great tendency to inflammation of the structures of the heart, and this event is the more to be feared in proportion to the youth of the patient. Endocarditis occurs in a large proportion of cases, and pericarditis is common; but rheumatic endocarditis and pericarditis differ from rheumatic arthritis in the fact of the former two leading to exudations of lymph and the formation of false membranes, which results are exceedingly rare in the articular affections. Bronchitis, pneumonia and pleurisy are occasionally induced, and the meninges of the brain are sometimes affected. Rheumatism is very rarely fatal *per se*, and when fatal is generally so from complications, especially cardiac and cerebral. One attack is very liable to be followed by others.

A liability to embolism may be stated as incidental to endocarditis: emboli may be formed in the left side of the heart, or a clot in the right side may cause plugging of the pulmonary artery or aorta, according to the side affected.

Pathology.—The rheumatic diathesis is supposed to be due to a morbid principle in the blood. This was at one time said to be uric acid, but the supposition of Prout is now generally adopted, *viz.*, that the “*materies morbi*” is lactic acid.

Causes.—Cold; a special hereditary predisposition. It seldom appears before five years of age; is most prevalent in humid changeable climates, and occurs most frequently in all climates within the temperate zone, being very rare in tropical or very cold climates.

Treatment.—Although innumerable remedial measures have been employed in this affection, such as calomel, bleeding, purging, colchicum, nitrate of potash, cyanides of zinc and potassium, propylamine and trimethylamine, the plan generally adopted at the present day is the alkaline treatment. This consists in the administration of large doses at short intervals of the bicarbonates or tartrates of potash and soda, until the urine is decidedly alkaline. To these lemon-juice may be very advantageously added, and this has been sometimes successfully employed by itself. To increase diuresis, the acetate, nitrate, or acid tartrate of potash or acetate of ammonia, with small doses of colchicum, may be given, but this last drug has no special remedial action in acute rheumatism. Opiates often afford the greatest relief, and are borne in large doses. For local applications, cloths saturated with alkaline and opiate solutions, and chloroform, are of great benefit, or simply wrapping the joint in cotton wool. Blistering the parts has found favour with some physicians.

Salicylic acid and the salicylate of soda have been much employed of late years; and there is fairly strong evidence that these drugs exert a powerful influence in lowering the temperature, in relieving the pain in the joints, and probably in conferring some immunity from heart complications. They must however be cautiously administered, and their lowering effects carefully watched.

SUB-ACUTE OR CHRONIC RHEUMATISM.

This may either follow the acute form or occur independently of it. If it follow the acute, the joints affected are left stiff, weak, and sometimes œdematous,

and the pain is usually confined to particular joints, but it may in some cases shift from joint to joint.

Gonorrhœal Rheumatism is the term applied to a variety of synovitis affecting the knee-joint, and sometimes other joints, and occurring in conjunction with gonorrhœa.

If only one or two joints be affected, local applications are indicated, as leeches or blisters at a short distance from the affected joints, and friction. Electricity, whether by the machine or galvanism, is often very useful in chronic rheumatism. If the disease be obstinate, the vapour-bath or the thermal mineral waters of Aix-la-Chapelle, Wiesbaden, etc., are indicated. In the form known as “cold” rheumatism, in which the patient is *warm and at ease in bed*, guaiacum is specially efficacious, but in the other form, the “warm” rheumatism, in which no relief is found in bed, colchicum affords the greatest benefit. Dover’s powder and iodide of potassium are often serviceable.

MUSCULAR RHEUMATISM.

This is an affection undoubtedly allied to neuralgia. The pain is often excruciating; the affected muscles are usually more or less tender, but there are no local symptoms, as redness, heat, or swelling, and there is little or no constitutional disturbance. This form of rheumatism receives various names, according to the parts affected. Thus it is termed **Lumbago** if the loins are the seat; **Pleurodynia** when the muscles of the side are affected.

The **Treatment** must consist of sinapisms, followed by soothing applications, rest, and anodynes. “Firing”

is recommended. The bromides of potassium and ammonium with the salts of iron and quinine are specially valuable.

RHEUMATIC GOUT.

This term relates to an affection which is neither gout nor rheumatism, but presents certain characters of either or both of these diseases. Adams, of Dublin, terms it **Chronic Rheumatic Arthritis**; Garrod proposes to name it **Rheumatoid Arthritis**.

According to Flint, the anatomical characters which distinguish it from gout and rheumatism are as follows: "A larger accumulation within the affected joints of synovial liquid, which in the course of the disease is absorbed; absorption of the inter-articular cartilages, eburnation of the ends of the bones denuded of cartilage, and enlargement of the ends of the bones by the deposit of bony matter; the formation of cartilaginous bodies, which either remain attached to the synovial membrane, or are found loose in the cavity of the joint. With these changes is associated more or less thickening of the synovial membrane or ligaments. The ligaments are not unfrequently elongated by prolonged distension from the synovial liquid, and complete or incomplete dislocations are apt to follow. The so-called chalky deposit of gout is wanting, but rheumatic gout may occur in persons who have this deposit as an effect of attacks of gout which have previously occurred. A peculiar distortion of the fingers is characteristic, *viz.*, an inclination to the ulnar or outer side of the hand."

There is no tendency to endocarditis or pericarditis. No classes of society are exempt, although the poor are the greatest sufferers. Females are said to be more often affected than males.

Treatment.—Improve the general health by nutritious diet and tonics, avoiding depressing remedies. Iodides of potassium, and iron, arsenic, and guaiacum are sometimes useful, together with cod-liver oil, chalybeate and tonic waters. **Locally**, small blisters and iodine, rest, passive motion, friction, and shampooing.

GOUT (gutta, a drop).

PODAGRA (πούς, the foot ; ἄγγρα, seizure).

The affection usually commences in the middle of the night by severe pain in the great toe of one foot, or of one of the thumbs, accompanied by rigors, and followed by feverish heat. The pain rapidly becomes excruciating, and the joint is so tender that the slightest pressure is insupportable. After a variable period the pain suddenly ceases, the skin becomes moist, the patient falls asleep, and sometimes wakes free from pain : usually, on awaking next morning, the painful swollen parts are of a deep red colour, shining and tense, the surrounding parts are œdematous, and the vessels turgid. After several nights and days with the continuance of the same symptoms, although in a milder form, the swelling subsides, the skin desquamates, and the joint either becomes healthy, or the chronic form of the disease sets in. One attack is usually followed by others at variable intervals ; and after numerous attacks the joints become stiff, and are frequently the seat of the so-called chalky deposit. Other deposits occur in connexion with the cartilages of the external ear (tophi), in the kidneys, and in other parts. Attacks of gout are usually preceded by dyspepsia, with irritability of temper and depression of spirits. If the inflammatory affection of the joints is

not produced, but the gouty diathesis prevails in the system, an affection of some internal part may appear.

Thus, if the **Heart** be attacked, angina, syncope, and palpitation may be observed.

If the **Stomach**, there is great depression of spirits, succeeded by intense gastralgia, vomiting, nausea, and eructations.

If the **Lungs**, dyspnoea, persistent cough, and asthma.

If the **Head**, vertigo and headache, leading to paralysis and apoplexy; if the **Spinal Cord** is attacked, there may be severe neuralgia, terminating in paralysis. These affections of internal parts, without local inflammation, have been termed **Atonic** or **Misplaced Gout**.

Retrocedent Gout is the term applied when the inflammation of the joints comes on in the ordinary manner but does not attain its usual severity or continue for the usual time, but suddenly ceases, the disease being transferred to some internal part.

Pathology.—It is ascertained that in gout there is an excess of **uric acid** in the blood. In some cases, swelling is produced by the presence of crystalline urate of soda in the inflamed part, both upon the synovial membrane and within the substance of the cartilages and fibrous tissue themselves.

Chronic gout may terminate in a severe form of Bright's disease (the granular kidney), a deposit of urate of soda taking place in the intertubular tissue and to a certain extent in the tubes.

Causes.—Most common in males; in adult age and middle life: seldom occurs before puberty, or between the ages of thirty and forty.

It is often hereditary, and produced by plethora and high living, and is generally observed in the rich and seldom in the poor. The presence of lead in the

system is said to predispose strongly to attacks of gout.

Treatment.—This must be directed both towards the paroxysm and the constitutional condition. For the former, the exhibition of colchicum, opium, and saline aperients is demanded ; whereas, for the latter, it will be advisable for the patient to take plenty of exercise, to avoid excess of carbonaceous and nitrogenous food, and to abstain from saccharine wines. Gin and whisky may be allowed. Moderation in eating must be enjoined, and the habitual use of the salts of potash and lithia is extremely important.

Locally, wrapping the parts in flannel, wool, and fleecy hosiery often affords much relief.

LEUCOCYTHÆMIA (λευκός, white, κύτος, a cell, and αἷμα, blood).

LEUKÆMIA (λεύκος, white, αἷμα blood).

LYMPHÆMIA (lympa, lymph, and αἷμα).

Definition.—A condition characterised by the presence of an abnormal proportion of white corpuscles in the blood.

In health the white corpuscles are in the proportion of 1 to 300 of the red, and to constitute Leucocythæmia the relative number of white cells must be at least 1 to 20 of the red.

Varieties.—**Splenic** and **Lymphatic.**—These divisions were made by Virchow, who associated the former with enlargement of the spleen, and the latter with a similar condition of the lymphatics.

Symptoms.—There is marked anæmia, with emacia-

tion, sometimes febrile excitement, and when vital force is rapidly impaired, death may ensue from exhaustion; diarrhœa is occasionally observed, and hæmorrhage from the nose and other situations may take place. The spleen is usually enlarged, and sometimes the glands; in many cases both.

Pathology.—In marked cases the blood acquires a reddish-grey or chocolate colour, and this is particularly noticeable in the cerebral veins and sinuses;

Microscopically there is a great increase in the proportion of the white corpuscles, and not unfrequently granular matter, probably arising from the disintegration of these bodies, is very noticeable. The spleen is usually found enlarged, and sometimes the liver, and in some cases the lymphatics in various parts of the body are enormously hypertrophied.

Yellow or yellowish-green collections, soft, and resembling thick pus, are sometimes found in the right cavities of the heart, and in the large vessels, and similar collections have been observed in the veins of the cerebral meninges and in other situations.

Virchow states that the number of white corpuscles is always increased when the lymphatics are the seat of irritation. An increase takes place in typhoid fever, in cancer with implication of the lymphatic glands, and in malignant erysipelas with enlargement of these glands.

Hughes Bennett regards the ductless glands as agents in the production of the corpuscular blood constituents, and considers the red globules to be the free nuclei of the colourless ones, and concludes that in Leucocythæmia the blood-producing function is disturbed, and that the white globules, not being transformed into the red, appear in the circulation in morbidly increased quan-

tities. Others think, however, that there is an increased formation of the white corpuscles.

It is questionable whether Leucocythæmia can be considered as a special disease, or as merely incidental to certain affections. It should be regarded rather as the pathological element of a cachexia, the essential nature of which is yet to be determined.

Treatment.—The same as of Anæmia.

SCORBUTUS—SCURVY.

Symptoms.—These come on gradually, and are characterised by extreme debility, a sallow muddy complexion, foul smelling breath, wandering rheumatic pains over the whole body, and blotches on the legs. The temperature is lower than the normal.

With the progress of the disease the gums become swollen, livid, and spongy, and bleed upon the slightest touch. In extreme cases the teeth may drop from their sockets, and hæmorrhage occur from many situations, such as the mouth, nose, intestines, and stomach. Effusions of blood appear upon the skin. When very small, these effusions are termed *petechiæ*, when larger, *vibices*, and when of considerable area *ecchymoses*.

Causes.—Predisposing are: great privation, marshy districts, bad food, and defective hygienic conditions.

Exciting.—The want of fresh vegetables.

Dr. Garrod believes scurvy to be occasioned by the absence of potash salts from the blood, since the disease may be cured by the administration of these substances.

Termination.—Usually recovery, but when fatal may be so from general dropsy, pleurisy, pericarditis, bloody diarrhœa, or extreme exhaustion.

Treatment.—Preventive measures should be adopted, such as lime-juice sweetened with sugar (one ounce of each), and taken daily, potatoes, oranges, or the freshly expressed juice of horseradish, mustard or water-cresses.

At first milk and soups should be given, but when the digestion improves vegetables and fresh meat will be beneficial.

To supply the deficiency of potash salts, the chlorate or tartrate of potash may be administered.

PURPURA (purpura, a shell-fish yielding a purple dye).

Symptoms.—This disease appears suddenly with slight fever, and is characterised by discolouration of the skin, which presents a number of circular spots varying in size from a pin's head to a pea, appearing first on the legs, and eventually spreading over the whole body, appearing like bruises. Blood may be effused into the different mucous membranes, and sometimes into the serous membranes. The gums are not spongy and livid.

Varieties.—(2) Purpura Simplex ;
(1) Purpura Hæmorrhagica.

Purpura Simplex is a mild form, in which the constitutional disturbance is slight ; there are very few spots, and the disease in general terminates in a few days.

Causes.—Privation, bad diet, fatigue, and defective hygienic conditions.

Purpura Hæmorrhagica is a very severe form, being specially remarkable for the effusion of blood into mucous membranes. These effusions may be seen during life on the tongue, gums, and interior of the

cheeks, and in fatal cases may be observed all through the digestive tract.

The constitutional disturbance is very great. The spots are rapidly developed; they are at first bright red, but subsequently become deep purple. The skin becomes blotched and tender, and the slightest injury occasions hæmorrhage.

Blood may ooze from the gums, the hæmorrhage being sometimes uncontrollable, and there may also be bleeding from the bowels, stomach, or lungs. Thus weakness, and anæmia, only may result, or the loss of blood may be great and fatal.

Treatment.—There is no special remedial plan, except to give nourishing diet and rest, and to place the patient in a well-ventilated room. Quinine, mineral acids, ferruginous and other tonics may be exhibited, but antiscorbutic remedies are of no service.

HÆMATOPHILIA.—THE HÆMORRHAGIC DIATHESIS.

Consists in a peculiar liability to hæmorrhage, which exists as a constitutional peculiarity in some persons. It is sometimes exhibited immediately after birth by bleeding from the umbilicus, is only checked with difficulty, and death from loss of blood not unfrequently results. It usually appears during or shortly after the period of dentition, being characterised by profuse bleeding from trifling wounds. The subjects of the hæmorrhagic diathesis continue to lose blood from the slightest wound, the hæmorrhage resisting all efforts to arrest it, sometimes proving fatal, and when not so, causing extreme anæmia. Extensive extravasations of blood beneath and within the skin often result, being produced by slight bruises.

Passive hæmorrhage may also take place, independently of wounds, from the nostrils, bronchial tubes, stomach, intestines, kidneys, and, in the female, from the uterus.

When children are affected they seldom attain to adult age, but the diathesis sometimes ceases after childhood, and when present in a moderate degree may not prevent longevity. It is often hereditary, and is frequently confined to certain members of a family. Males are more liable to the disease than females.

The blood is probably deficient in fibrin, or in the power of coagulation, but the exact character of the disease is at present unknown.

The **Treatment** must consist in supporting the strength, avoiding wounds, and applying local hæmodynamic remedies.

SYPHILIS (σύν with, φιλέω I love).

Definition.—A specific disease contracted by contact with a peculiar secretion from the generative organs.

Syphilis is most commonly the result of impure sexual connexion. At first a small red papule appears, succeeded by induration and hardness. After a few days enlargement takes place in the lymphatics of the groin.

The papule now becomes scaly or surmounted by a thin crust, after removing which the surface beneath appears of a bright red colour, with scaly secretions. In about six or eight weeks after the appearance of the papule an eruption appears on the skin, red in colour, and accompanied by itching.

Constitutional symptoms now commence : *pari passu*

with the red eruption, or soon after its appearance, the throat becomes inflamed, the inflammation either leading to ulceration, or to the formation of flat circumscribed growths on the mucous membrane; other accompaniments are baldness, pain in the bones, nail affections, iritis, or inflammatory conditions of the deeper structures of the eye.

Terminations.—The symptoms disappear, health being restored in about twelve months from the time of infection, or, as is more usual, new crops of eruption appear and disappear on the mucous membranes and on the skin. These eruptions are of various kinds, such as roseola, impetigo, lichen, lepra, etc.; but the most common are the squamous varieties, which form patches of a copper colour and of a circular shape, the scurf being renewed as soon as it is shed. Small papules are present on the tongue, and patches of psoriasis on the soles of the feet, palms of the hands, and other parts of the body.

In weak and scrofulous subjects, suppurations may follow the eruptions, which then become encrusted and form ulcers, and subsequently cicatrise. The throat and nasal cavities may be the seat of ulceration, the bones being denuded and the nose depressed permanently, and tumours may occur in internal organs, the liver, the brain, and the testicles in particular. These tumours have been termed *gummata*, from the translucent appearance at the growing edges which they exhibit in the recent state. They consist of an increase of the elements of the connective tissue, and take their origin in the vascular walls; they subsequently lose their translucency and softness, becoming firmer and tougher.

Phthisis may follow syphilis, as may also albuminous dropsy and lardaceous disease of the internal organs.

Causes.—Constitutional symptoms may be occasioned by kissing, by syphilitic nurses, or by vaccination, when the lymph of the vesicle becomes mixed with the blood.

The infant may be tainted with syphilis through either parent, and may exhibit syphilitic manifestations even at birth, but usually, from a few weeks to a few months, the nates may be the seat of mucous tubercles, red patches appearing upon the buttocks, hands, or feet. The lips and nose may also be fissured. The infant presents a peculiar old-man appearance, the skin hanging in loose folds; there have usually been the characteristic snuffles at birth.

Congenital syphilis often produces a peculiar peg-shaped or screw-driver notched appearance of the upper central incisors of the permanent teeth, and the eyes may be affected with keratitis, or chronic inflammation of the cornea.

Treatment.—All remedial measures are useless without the aid of mercury; but it is unknown in what manner this drug acts. It may be employed as an inunction by means of the unguentum hydrargyri, or by fumigation, or by hypodermic injection of the perchloride, one grain of the salt being dissolved in 100 minims of glycerine and water in equal proportions, 4 to 7 minims, or about $\frac{1}{25}$ to $\frac{1}{15}$ of a grain of the mercurial being injected twice or three times daily.

A better method, however, is by using the albuminate of mercury, rendered soluble, and 3 minims injected.

The best situations for hypodermic injection are the back and sides of the thorax.

Condylomata or flat growths upon the mucous membrane of the anus may be dusted with calomel or iodoform.

ERYSIPELAS (*έρυω*, I draw ; *πέλ.ας*, near).

Definition.—An exanthematous inflammation, accompanied by redness, swelling, and hardness of the skin, ending as a rule in resolution or desquamation, and sometimes by suppuration, and occasionally, though rarely, in gangrene.

Symptoms.—The usual site of medical erysipelas is the face and head, beginning as a slight swelling by the side of the nose or one of the ears, spreading until the whole of the face and scalp is involved, the nose assuming an enormous size, and the eyes becoming obscured by the distended eyelids. There is generally feverishness, loss of appetite, and thirst.

The affected parts are very stiff and painful, and the neighbouring lymphatic glands are swollen. The accompanying fever is usually high—the temperature may rise to 105° Fah.; and when the redness fades, small vesicles may form.

Period of Incubation.—From 5 to 7 days usually.

Terminations.—As the inflammation decreases, suppuration of the subcutaneous cellular tissue may take place and abscesses may form.

Occasionally the membranes of the brain are attacked, and symptoms of meningitis may appear; or the disease may prove fatal by blood-poisoning, or by œdema of the glottis inducing suffocation.

Complications.—Bronchitis, pneumonia, and acute desquamative nephritis.

Treatment.—The patient should be placed in a well-

ventilated room, and absolute quiet insured. At the commencement of the attack a calomel purge may be given. Chief reliance must be placed upon the ferruginous preparations, especially the tincture of the perchloride of iron.

Locally, the affected parts may be dusted with flour, starch, or oxide of zinc, and covered with flannel.

The whole surface may be lightly touched with nitrate of silver or tincture of iodine, or a covering of castor-oil or collodion.

DISEASES OF THE LUNGS.

BRONCHITIS (*βρόγχος*, the windpipe; *itis*, *ἴηαι*, to urge against, denoting violent action, used as a terminal to indicate inflammation).

Definition.—An inflammation of the mucous membrane lining the bronchial tubes.

Primary Divisions.—(1) Acute; and (2) Chronic.

Varieties.—(1) Capillary (when involving the smaller tubes); (2) Confined to the larger tubes; (3) Plastic (with formation of false membrane).

Causes.—Cold, and alternations of temperature; the local irritation set up by dust and noxious vapours, or by mechanical operations, as needle-grinding. Septic influences in the blood, supposed to be present in kidney disease, and in such febrile maladies as measles, scarlatina, small-pox, etc.; obstruction of the bronchial veins, as occurs in consequence of disease of the mitral valves; rheumatism and gout. Most frequently occurs at the extremes of life, *i.e.*, in childhood and old age.

Pathology.—In the **acute** form: redness of the mucous membrane of the tubes, which are at the same time soft, thickened, and coated by frothy mucus.

In the **chronic** form: increase of the muscular structure with thickening and striation of the mucous and sub-mucous tissue. The tubes are usually constricted; but occasionally dilatation is produced (Bronchiectasis), a bronchial tube becoming so dilated as to form a pouch, or series of pouches.

In the **plastic** form: exudation of false membrane upon the inflamed mucous surface.

ACUTE BRONCHITIS.

Symptoms :—

Rational signs.—General fever symptoms, a full rapid bounding pulse, and hot dry skin, frequently urgent dyspnoea, with wheezing and sense of constriction across the chest. The tongue is furred, the urine high-coloured and scanty, often depositing lithates; expectoration of, at first, slightly viscid sputa, becoming afterwards abundant and frothy; in severe and prolonged attacks the sputa become muco-purulent, and are accompanied by a ringing, noisy cough.

Physical signs :

Percussion.—Of no great value: the chest being equally resonant on both sides, since the lungs are unaffected.

Auscultation.—The presence of “*sonorous rhonchi*,” when the disease is limited to the larger bronchial tubes; of “*sibilant rhonchi*,” when the smaller ramifications are affected; and of “*mucous rhonchi*” when the capillary or smallest tubes are involved.

All these signs may be present in one case.

In the early stage of the inflammation two dry sounds are generally present, termed sonorous and sibilant rhonchus ; both of these indicate a partial narrowing of the air tubes, of which the mucous membrane is dry and tumid. Sonorous rhonchus need occasion no alarm, since it shows that the larger bronchial tubes are alone involved. Sibilant rhonchus is a far more grave indication, denoting that the smaller ramifications are affected.

As the disease goes on, a viscid, transparent tenacious mucus is exhaled from the inflamed membrane ; two different sounds are now to be detected, viz., large and small crepitation, often called moist sounds, or mucous rhonchi. The air passing through the bronchial tubes becomes mixed with the mucous secretion, and thus numerous air bubbles continually form and burst.

If this event takes place in the larger ramifications, the so called large crepitation, or bubbling rhonchus, is produced ; when in the smaller, small crepitation.

Terminations. —Acute Bronchitis, in the majority of cases, and especially in the young, ends in complete recovery, and indeed is rarely fatal except in old persons, but it may pass into the chronic form, and a complication termed broncho-pneumonia, is not unfrequent.

In favourable cases the affection declines about the fourth to the eighth day, and then entirely subsides or passes into the chronic form.

If, however, no relief is afforded by remedies, or by the copious expectoration, great prostration of strength results, accompanied by signs of intense pulmonary congestion, partial asphyxiation follows, and death rapidly ensues.

CHRONIC BRONCHITIS

Is among the occasional sequelæ of the acute form, but it may commence as an ordinary cold in middle-aged persons, and even in the young, and continue for a variable period. In old persons it is very frequent, and is notable for returning, sometimes year by year, with increasing severity. The pulse is usually small and weak, or unaffected. The strength may be greatly prostrated. The expectoration is scanty, or copious and even purulent. There is not unfrequently much pulmonary congestion with dyspnœa, or even orthopnœa. The physical signs are the same as those alluded to under Acute Bronchitis, varying with the respective parts involved. This affection is frequently observed in miners, knife-grinders, etc., from the nature of their occupation, and it may sometimes depend upon constitutional affections, such as rheumatism, gout or syphilis. Emphysema is one of the common sequelæ of this chronic form, and disease of the right side of the heart may follow a long continuance of the disease.

TREATMENT.

Of Acute Bronchitis. In plethoric persons bleeding may be resorted to, or the exhibition of tartar emetic in doses of $\frac{1}{4}$ grain to $\frac{1}{2}$ grain every three or four hours; counter-irritants, as linseed or mustard poultices, Tinctura Iodi Composita, Linimentum Iodi, and blistering may in some cases be applied to the chest. Pulvis Ipecacuanhæ, Pilula Conii Composita, and Vinum Ipecacuanhæ will be found serviceable.

Of Chronic Bronchitis. It must be borne in mind that acute bronchitis is a sthenic disease, but the

chronic form is one of asthenia, and therefore, in the latter, bleeding and depletory measures must generally be avoided.

Ipecacuanha, squills, senega, and carbonate of ammonia, are often exceedingly useful, and when there is great constriction of the chest and difficulty in getting rid of the phlegm, an emetic of 20 grains of pulvis ipecacuanhæ often acts like magic. With a history of gout colchicum will be indicated; excessive expectoration may be treated with tincture of benzoin and opium preparations; and cough or spasm will derive benefit from steam and other inhalations, as of tar, chlorine, or iodine.

Emetics, especially of Ipecacuanha, are of great value, since they not only relieve the bronchial tubes of the accumulated mucus, but also appear to act specifically upon the mucous membrane.

PLASTIC OR FIBRINOUS BRONCHITIS.

Here the tubes are filled with plastic lymph. This form frequently accompanies or follows diphtheritic disease of the larynx and trachea. Arboriform casts of the bronchi are sometimes expectorated, and these have been termed "*bronchial polypi*." In addition to the ordinary symptoms of bronchitis, severe hæmoptysis is not unfrequent, and the cases are in general of a very serious character. It is more frequent in males than females, and occurs usually between ten and thirteen years of age. In those cases in which the minute bronchial tubes are invaded by plastic lymph, the disease is probably complicated with pneumonia. The indications for treatment in this form are emetics to

remove the casts, and iodide of potassium is stated to be very serviceable.

EMPHYSEMA (ἐμφυσάω, I inflate).

Definition.—An over-distension by air of the cells or interlobular substance of the lungs.

Varieties.—(1) Vesicular ; and (2) Interlobular. In vesicular emphysema the air-cells are dilated, and sometimes communicate one with another. In the interlobular variety air is extravasated into the connective tissue, which also becomes distended.

The first form of emphysema is termed *vicarious*, when the affected parts are dilated to compensate for the imperfect expansion of the lung ; and *substantive* when occurring from causes primarily affecting the air-cells, as is seen in whooping-cough from the forcible expiratory efforts during closure of the glottis.

Symptoms :—

Rational signs.—Habitual shortness of breath, feeble cough, weak slow pulse, dusky hue of countenance, attacks of asthma, inability to take active exercise, fits of dyspnœa and orthopnœa, with expectoration of thin mucus mixed with tenacious clots, and filled with air bubbles.

Physical signs :—

Percussion.—Hyper-resonant.

Auscultation.—The respiratory murmur is always diminished and distant. The heart sounds may be masked or feeble, and sometimes inaudible and the expiration wheezy.

Inspection.—The chest is enlarged, and of a box or barrel-shape in the adult ; forming the so-called pigeon-breast of the child.

Pathology.—The lungs are distended, pale, and bloodless, feeling like wool. The cells are enlarged, the lobules often ruptured, and communicating one with another, forming little bladders of air which are usually found around the thin anterior margins of the lungs.

Terminations.—Congestion of the venous system; hypertrophy and dilatation of the right side of the heart, and tricuspid disease of the heart.

Causes.—Frequent attacks of bronchitis, producing impairment of elasticity and contractility of the air cells; degeneration of the lung tissue through old age; violent and repeated exercise of the voice; playing on wind instruments; whooping-cough.

Treatment.—This can only be palliative, as the affection is permanent. It may, however, consist of diffusible stimulants, Ammonia, Hyoscyamus, Tinctura Camphoræ Composita, Spiritus Chloroformi, Lobelia, Æther, warm clothing, daily use of the cold sponge or shower bath; for the relief of wind and indigestion, aloetic purgatives and emetics. Smoking stramonium cigarettes, or inhaling the vapour of burnt nitrate of potash papers, is often useful.

ASTHMA (*ἀσθμα*, laborious breathing).

Definition.—A spasm of the white circular fibres of the unstriated muscles of the bronchial tubes, the admission of air to the lungs being thus limited or diminished.

Varieties.—**Idiopathic or Spasmodic**, if uncomplicated.

Organic or Symptomatic, when associated with heart disease, bronchitis and other diseases.

Symptoms.—The attack comes on in paroxysms occurring usually at night, and waking the patient from

sleep. There is gasping for breath from the feeling of constriction and suffocation; the inspiration is convulsively violent, the expiration prolonged and comparatively easy, both acts being attended by wheezing. Various postures are assumed to obtain relief, such as resting the hands upon some solid body to assist the muscles of respiration. The pulse is usually feeble, the countenance anxious and imploring, the eyes staring, the skin cold and clammy: after a time comes a remission; during the intervals the patient is quite well. The attacks are often periodic. The affection is more frequent in males, and is often hereditary.

Causes.—Some peculiar odour, as of hay or ipecacuanha, in certain individuals; a cold wind; pulmonary and cardiac diseases. Asthma may also result from indigestion, due to over-eating, the stomach becoming distended, and the diaphragm pressed upon.

Complications.—Asthma, as a symptom, may accompany phthisis, aneurism, valvular disease, and fatty degeneration of the heart, bronchitis, and emphysema.

Treatment.—During the spasm, or paroxysm, any tight clothing must be removed, and fresh air procured. Tobacco is often found useful, and stramonium in the form of pipe or cigarettes is of great service; inhalation of chloroform may be tried.

The fumes of burnt nitrate of potash papers, and nitrite of amyl, are sometimes of service.

Stimulants, as ammonia, coffee, ether, and lobelia, are other remedies.

During the interval.—Change of residence is frequently beneficial, not always from town to country, for at times the reverse does good. The bowels should be moderately purged, and over-eating carefully avoided.

Tonics should always be given, and antispasmodics are often useful.

PNEUMONIA.—PNEUMONITIS (*πνεύμων*, the lung ; itis.)

Definition.—Inflammation of the lung substance.

Primary Divisions :—

- (1) Acute, Plastic, Lobar, or Croupous.
- (2) Catarrhal or Lobular (Broncho-pneumonia).
- (3) Chronic, Interstitial, Cirrhotic, or Fibroid.

Causes.—Exposure to cold ; fevers and febrile conditions ; disease of the kidneys and heart, especially of the mitral valves. It may arise spontaneously (idiopathic), or result from injuries (traumatic).

ACUTE PLASTIC OR LOBAR PNEUMONIA,

Usually involves a considerable extent of the lung. It is characterised by the following stages :—

- (1) Engorgement, Congestion, Hyperæmia or Splenisation.
- (2) Consolidation, or Red Hepatisation.
- (3) Purulent Infiltration, or Grey Hepatisation.

Symptoms :—

Rational signs—Severe rigors, followed by dull aching pain in the side ; general fever symptoms, thirst, skin pungently hot and dry, tongue white, urine thick and scanty ; cough, accompanied by expectoration, which is thick, glairy, and voided in rounded masses, which adhere to the side of the vessel, gradually becoming rust-coloured from the presence of altered blood-corpuscles, as the disease passes into the second stage ; simultaneously with the second stage there is an absence or deficiency of the chlorides in the urine.

Dyspnœa is present, the breathing being accelerated and oppressed, and twitching of the alæ nasi is a characteristic sign in children; an herpetic eruption may appear upon the lips and nostrils. The pulse is full and quick, and delirium sometimes occurs at night. The average temperature during the height of the disease is 104° Fah. : the respirations being about 40 in the minute (in health the respirations usually vary from ten to twenty per minute). One or both lungs may be affected.

In favourable cases the severity of the attack declines in about a week or ten days; but pneumonia sometimes continues for a long period, and produces very serious conditions. The base of the lung is more liable to the disease than the apex.

Physical signs of 1st stage:—

Percussion.—Unimportant.

Auscultation.—‘Fine crepitation.’

This physical sign may be compared to the rubbing of the hair between the fingers, or to the crackling emitted when salt is thrown upon the fire.

It is probably due to the bubbling of air through the fluid in the vesicles, or to the fact of the vesicular walls, glued together by exudation, being forcibly separated by the air during inspiration.

Physical signs of the 2nd stage:—

Percussion.—Dull over the solidified portion.

Auscultation.—Bronchial breathing, due to a permeable bronchus passing near the consolidated mass, the sound traversing a solid conducting medium.

‘Bronchophony,’ the voice being conducted through a solid medium.

Absence of respiratory murmur and of crepitation.

Palpation.—Increased vocal fremitus.

Physical signs of the 3rd stage :—

Percussion.—Dulness over the solidified portion.

Auscultation.—More or less of the physical signs of the 2nd stage, with the addition of ‘mucous gurgling.’ Twenty-four hours may suffice for the change from the 1st to the 2nd stage.

One portion of the lung may be in the 1st, another in the 2nd, and a third in the 3rd stage ; and, therefore, the auscultatory signs may vary in different situations.

Terminations :—

(1) Resolution (entire recovery), preceded by the re-appearance of fine crepitation (‘crepitationo redux’).

(2) Purulent infiltration, recognised by mucous gurgling.

(3) Gangrene (rare), known by great fœtor of breath, prostration, and hectic fever.

(4) Abscess (also rare), described under Phthisis.

(5) Unabsorbed deposits, becoming ‘caseous,’ leading to consumption.

Pathology.—1st stage: Great congestion of lung capillaries ; the lung, consequently, redder and larger than usual. On section, blood, serum, and froth exude. The whole organ somewhat resembles the spleen ; its sponginess and elasticity are lessened, but it still floats on water.

2nd stage : The spongy character of the lung is lost, the organ becoming hard and solid, resembling liver ; effusion of albumino-fibrine or plastic lymph, and coagulation of fluid in the vesicles. The lung sinks in water, and it breaks down when pressed by the finger.

3rd stage : Diffused suppuration of the pulmonary tissue. Cavities of pus, and pus points bursting from all parts of the lung on pressure ; the lung sinks in water.

N.B.—Pneumonia need not go through the three

stages, and is not a fatal disease *per se*. It seldom exists alone, but is frequently associated with pleurisy and bronchitis as pleuro-pneumonia, and broncho-pneumonia.

Treatment.—In plethoric patients: bleeding, calomel, ipecacuanha, and tartar emetic. In other cases, and these are the majority, keep the patient in bed, the temperature of the room being not lower than 65° F., the air kept moist by steam, and administer salines, as liquor ammoniæ acetatis, with spiritus ætheris nitrosi; in cases of exhaustion, brandy with milk and raw eggs and ammoniæ carbonas will be indicated.

CATARRHAL OR LOBULAR PNEUMONIA (BRONCHO-PNEUMONIA),

Usually occurs in the lungs of children, or may follow an ordinary cold in old or weakly persons, it is observed in those portions of lung which have become collapsed from bronchitis, single lobules with the small bronchi and the surrounding tissue being usually alone involved, these being red and firm.

In this form the consolidation is limited to single lobules, and disseminated over the lung in variously sized patches.

In plastic or lobar pneumonia the consolidation is massive. Again, lobular pneumonia is nearly always accompanied, or even preceded, by capillary bronchitis; it is constantly associated with whooping-cough and measles. It may always be considered a morbid secondary process, seldom, if ever, occurring primarily.

There is no dulness on percussion, unless the inflammatory centres have united over a considerable portion of the lung substance, in which case certain

dull areas may here and there appear, and auscultation may merely show the signs of bronchitis. The temperature is high ; both lungs are usually affected ; there are no rusty sputa nor distinct rigors.

The mortality is far greater than in the lobar variety. On section in a recent case, the lobules appear as ill-defined reddish-grey nodules ; bloody fluid can be squeezed out, and the surface of the lungs is smooth instead of granular.

INTERSTITIAL, CIRRHOTIC, OR FIBROID PNEUMONIA.

In this form, the lymph which is always exuded in pneumonia, and usually thrown off by expectoration, remains in the lung, and degenerates into fibrous tissue and caseous matter. The lung substance is black or dark grey in colour, hard, and permeated by bands of fibres often enveloping old masses of tubercle. It is usually dependent on pre-existing inflammation.

As increase and hardening of the connective tissue takes place, the air-cells are diminished in calibre, and are replaced by fibroid growth.

When the growth is fully developed the lung is solid, and hard to the touch ; its size is diminished, and on section it appears smooth and shining, and creaks under the knife.

The term cirrhotic is adopted, since by some writers the change is regarded as the same which takes place in liver or kidney cirrhosis.

The treatment should consist in placing the patient in a moist atmosphere, or in giving baths at 77° to 86° Fahr.

Internally, senega, ammonia, and the general treatment of pneumonia may be employed.

PLEURITIS.—PLEURISY ($\pi\lambda\upsilon\rho\acute{\alpha}$, the side ; itis).

Definition.—Inflammation of the pleura.

Causes :—Inflammation of neighbouring organs ; injuries, as broken ribs and the bursting of abscesses from the lungs ; exposure to cold ; febrile conditions, and diseases of the kidney.

Stages.—(1) Early or Dry ; and (2) Advanced or Effusive.

Symptoms :—

Rational signs.—General fever symptoms, unhealthy look, hot dry skin, white furred tongue, anxious countenance, headache, severe lancinating pain in the side, chiefly in the mammary region, increased by deep inspiration, by coughing, or by lying upon the affected side, short dry cough, pulse wiry, *i.e.* hard, small, and rapid, vibrating under the finger like the tense string of a musical instrument, shortness of breath, and difficulty of breathing. The attack is generally sudden, and there may be no distinct rigor.

Physical signs of the early or dry stage :—

Percussion.—Little differing from the normal.

Auscultation.—A friction sound, synchronous with the breathing, and due to the grating on one another of the opposed dry pleural surfaces.

Physical signs of the advanced or effusive stage :—

Percussion.—Dull over the affected part commensurate with the amount of effusion and varying with the position of the patient.

Auscultation.—The voice sounds are more or less

distinct, according to the effusion. When only a *thin* layer of fluid exists in the pleural cavity, a peculiar modification of the voice is heard, termed, 'Ægophony;' should the layer either become absorbed or increased, this sound will disappear; but when the effusion diminishes, ægophony reappears, like the *redax* crepitation of pneumonia. This sound may be compared to the bleating of a goat, or to the peculiar noise emitted by the itinerant performers of *Punch*.

Palpation.—Absence of vocal fremitus when the effusion is great.

Mensuration.—The affected part measures more than the other, but it must be remembered that in many cases the right side of the chest is naturally rather larger than the left.

As the disease advances and the effusion increases, the patient no longer lies on the sound side, since by so doing, compression of the sound lung may take place. He therefore lies either upon his back or upon the affected side.

Duration.—Variable; from five to six days to as many weeks.

Pleurisy is usually simple, but the disease may extend and constitute double pleurisy.

Terminations.—

(1) Resolution (very rare); usually in adhesions from organisation of the effused fluid.

(2) Hydrothorax (effusion of serous fluid).

(3) Empyema (conversion of effused serum or lymph into pus).

Pathology.—(1) The surfaces of the pleura are at first dry from the arrest of the ordinary secretion consequent upon inflammation, and the subserous areolar tissue is injected.

(2) Lymph, or serum, is effused, or lymph-flakes mingled with pus, and recent adhesions are to be observed.

(3) The pleural sac is filled with pus.

Effects.—The chest wall may be pushed out, the lung being flattened against the spine and appearing tough and leathery. On section the lung texture is found to be devoid of air. The opposite lung is frequently congested, and puerile respiration is heard upon auscultation. If the effusion be upon the right side, the diaphragm and liver are displaced downwards; if it be upon the left, the heart is pushed over to the right side. Lateral curvature of the spine may occur from contraction of the whole of the affected side, in consequence of the fluid being absorbed, and the lung incapable of expanding.

Treatment.—Mustard and linseed poultices, and blistering, on the affected side in an early period of the affection, but after the occurrence of effusion repeated blistering, and the blisters kept open. Internally digitalis, iodide of potassium, and other salts of potash, squills, and liquor ammoniæ acetatis must be administered. As a final resort paracentesis thoracis over the seat of the effusion between the 5th and 6th ribs posterior to their angles will be sometimes necessary.

PHTHISIS (*φθίω*, I waste away).

Definition.—A disease of the lungs characterised by the presence of a peculiar morbid substance called ‘Tubercle.’

This disease may be conveniently divided into the following

Stages.—(1) *Deposition.*—From the first appearance

of the *scattered* miliary tubercles in the lungs until their *aggregation* into masses, and the consequent development of solidification of the lung-tissue at these points.

(2) *Softening*. — From the breaking up of the tubercles until the formation of small abscesses or cavities.

(3) *Cavity*.—The junction of the small cavities to form one or more large ulcerative cavities.

Symptoms.—*Rational signs* (very characteristic.)

(1) Cough (short and hacking) not relieved by ordinary remedies.

(2) Emaciation (progressive.)

(3) Pulse rapid and weak (120-130.)

(4) Night-sweats.

(5) Hæmoptysis (important, but not always present; generally in early stages.)

(6) Expectoration; mucous in first stage, mucopurulent in second, and purulent in third.

(7) General anæmia.

(8) Nails recurved and clubbed.

(9) Eyes pearly and lustrous.

Physical Signs of 1st stage :—

Percussion	{	at commencement ...	Unimportant.
		at end	Dull.
Auscultation	{	at commencement ...	Jerky, 'wavy' inspiration.
		at end.....	Inspiration harsh and expiration prolonged, becoming 'tubular.' 'Bronchophony.'

Physical Signs of 2nd stage :—

Percussion ...Dull

Auscultation... 'Muco-crepitant rhonchus,' or 'muco-crepitation.'

Inspection ...Flattening above and below the clavicles of one or both sides.

Physical Signs of 3rd stage :—

Percussion { over a superficial cavity Hyper-resonant.
over a deep cavity ...Dull.

Auscultation { over a cavity containing pus and air ...'Mucous-gurgle.'
over a cavity containing only air.....'Amphoric or cavernous respiration.' 'Pectoriloquy.'

Pathology of Tubercle.—There are two kinds of tubercle, viz. :—

(1) The *grey miliary*, or grey granulation tubercle; about the size of a millet seed, composed chiefly of albumen. Microscopically presenting a faint cellular organisation.

(2) The *crude* or *yellow* tubercle; about the size of a pea or bean, consisting chiefly of albumen and fat globules. Microscopically presenting no cellular organisation whatever. Occasionally carbonate and phosphate of lime are deposited in this variety, giving rise to a process called *calcification* or *cretification*, the tubercle being then termed *obsolete*.

Most authors formerly considered that these varieties were merely stages of the same disease, that the same constitutional affection gave rise to both, and that the crude tubercle must be necessarily preceded by the grey miliary; but some later views of the pathogeny and progress of the disease seem to point to an outgrowth of pre-existing disease of the lung, as in bron-

chitis, pneumonia, and pleurisy, and phthisis is thought sometimes to attend or follow general diseases, as syphilis and albuminuria.

The more recent theory alluded to supposes that an inflammation, whether pneumonia, pleurisy, or bronchitis, instead of undergoing resolution or its products becoming absorbed and thrown out (*vide* Pneumonia) leaves unabsorbed deposits which assume a fibroid character, termed cirrhotic, and give rise to yellow and miliary tubercle.

The well-recognised hereditary tendency of phthisis, and the result of everyday experience in private practice, in Hospitals, Dispensaries, and Life Insurance Offices, would seem to point to the earlier views as being more generally applicable.

Terminations.—Sometimes, when only miliary tubercles exist, *Resolution* may take place, but in other cases the tubercles soften and abscesses are formed which at length coalesce to form a large ulcerative cavity, or sometimes the cavity may become cicatrised and calcification may take place. The ordinary duration is from six to twenty-four months; the disease being rarely fatal in less than three months except from complications.

Causes.—Inherited or acquired, insufficient and bad food, impure air, dust in the air, confinement and sedentary occupations.

Treatment.—In the first stage improve the condition of the blood and the tone of the system by cod-liver oil, iron, quinine, the mineral acids, especially phosphoric acid, good diet, fresh air, moderate exercise, warm but not too heavy clothing. Counter-irritation with sinapisms, blistering and painting with iodine and the use of the flesh brush will be useful; and to

alleviate the cough, the exhibition of such sedatives as hyoscyamus and conium, and mild expectorants, especially ipecacuanha. In the second and third stage simply treat the symptoms. With regard to change of climate the following places are considered best: Torquay, Undercliff, Isle of Wight, and Hastings, Madeira, Malaga, and especially Algiers, since the last-named climate is nearly unvarying throughout the whole year. For pure dry air, the higher regions of the Alps are now held in high estimation.

N.B.—Hectic fever is common during the third stage, indicating the formation of pus, and it is chiefly characterised by flushings and night sweats. The microscope, in the second stage, often exhibits in the expectoration lung-tissue and pus-globules. To detect the elastic fibres of the lung-tissue, the sputa should be mixed with an equal quantity of caustic soda in distilled water, about 18 to 100. The mixture should then be boiled, stirred frequently, three or four times the bulk of water added, and allowed to stand in a conical glass. The fibres are contained in the deposit. The wavy, jerky inspiration of the first stage must not be implicitly relied upon, since it may occur in hysterical and nervous subjects.

In addition to the rational signs above described there are often dyspeptic symptoms; diarrhoea; notably thickening and ulceration of the larynx; and a peculiar festooned appearance of the gums.

In women the menstrual functions are more or less disturbed, and the catamenia generally cease.

The above disease may be termed Chronic Phthisis, but a condition is known as Acute Phthisis, or Galloping Consumption. This runs a very rapid course, and

is a rare disease. Death may take place in less than five weeks. The onset is sudden, there are rigors and high fever, profuse sweatings, cough, and dyspnoea, with great prostration. Here the tubercular degeneration appears to depend upon catarrhal pneumonia, the consolidation breaking down into caseous matter, cavities of variable size being formed at times all over the chest.

HYDRO-PNEUMO-THORAX

Is an occasional result of phthisis. In this condition there is a perforation from the lung into the pleural sac which is partly filled with air and partly with fluid.

It may also be caused by a fractured rib or by blows on the chest.

The symptoms are sudden acute pain, dyspnoea and fainting. The lips become swollen and blue. On percussion there is either hyper-resonance or dulness, according to the amount of air or fluid present.

Succussion yields a splashing sound, and upon auscultation 'metallic tinkling' is heard, supposed to be caused by drops of fluid falling from the roof of the cavity into the fluid beneath.

PNEUMORRHAGIA—PULMONARY APOPLEXY.

This is of somewhat rare occurrence, and consists in an extravasation of blood into the air-cells of the lung, and sometimes in an infiltration of the interstitial tissue. In some cases it is incidental to bronchial hæmorrhage in consequence of the violent inspiratory acts driving the blood backwards from the bronchial tubes into the air-

cells. In fatal cases the morbid appearances are of two kinds: in one form solid masses or nodules varying from the size of a pea to that of a walnut are found in one or both lungs, these organs being solidified from the coagulation of the blood within the cells; the limits of the nodules are sharply defined by the lobular divisions, the nodules feeling like hard projecting tumours; upon section the organs appear dark or even black; grumous blood may be scraped from the cut surfaces. In the other form the coagulated blood is more widely diffused; larger portions of the lung are solidified, and they are not bounded by the lobular divisions. Pneumorrhagia may be caused by violent blows upon the chest, or it may occur in purpura or scurvy, but in the greater number of cases it is produced by congestion of the lungs, and by cardiac disease, especially of the mitral valves.

The diagnosis is attended with considerable difficulty; hæmoptysis may be present in greater or less quantity. The respirations are hurried and laboured, and percussion will probably yield dulness over the solidified portions of the lung. Blood in the cells and smaller air-tubes may give rise to crepitant rhonchus within a limited space.

All that can be done in the way of treatment is to palliate the symptoms and support the powers of life, since these cases usually proceed to a fatal termination.

CANCER OF THE LUNGS

May be either hard (Scirrhus) or soft (Medullary). It is usually the latter, commencing in the bronchial glands. In the former a white, hard, firm tumour is

presented, yielding a juice which, under the microscope, is seen to contain caudate nucleated cells. The latter variety is soft, bloodstained and vascular. Cancer is found in various other parts of the body.

Diagnosis may be said to be exceedingly difficult; there may be flattening of the chest, impairment of the respiratory movements, pain, emaciation, night sweats and cough; the expectoration is purulent and often mixed with dark coloured blood resembling red-currant jelly; and sometimes foetor of the breath is observed. The history of the patient, the absence of other pulmonary disease, and the presence of cancer in the neighbouring glands, will greatly aid the diagnosis. Death is the inevitable termination, and all that can be done is to treat the symptoms, and support the patient.

DISEASES OF THE HEART.

Organic Diseases.

PERICARDITIS.

(*περι*, around; *καρδία*, the heart; *itis*).

Definition.—Inflammation of the pericardium or fibrous sac containing the heart.

Pathology.—In recent cases lymph is observed, of a pale-straw colour, soft, tenacious and firm, and mixed with serum and flakes of fibrin. The surfaces of the serous membrane are shaggy and rough, and present honey-comb depressions; at later periods there are exudations of lymph and fibrinous serosity causing adhesions between the opposite surfaces which may ob-

literate the pericardial cavity; where the powers of life are very low there is considerable serous effusion constituting dropsy of the pericardium (Hydropericardium). Pus is rarely, but occasionally present (Pyopericardium) and sometimes tubercles are observed (Tubercular Pericarditis).

Symptoms :

Rational Signs. — None of these are diagnostic; pain may be present, but it is a very fallacious symptom, since the worst cases have occurred without any pain at all. Pain may be elicited when absent, and increased when present, by deep pressure over the heart, by upward pressure against the diaphragm, or by lying upon either side. There is general fever, the pulse is full, hard, and “jarring,” often irregular and intermittent; a great feeling of oppression, extreme restlessness, the skin is either bathed in sweat or dry and hot, and the countenance expressive of great anxiety; delirium is a very frequent symptom, inducing the belief that the brain is affected.

Physical Signs :

Percussion.—During the early periods is little different from that of health.

Auscultation.—A double friction sound, “attrition murmur,” “to and fro” sound, or exocardial murmur is heard; this sound has been compared to the rustling of silk, the unfolding of a crisp bank-note, or the creaking of a new boot; it is synchronous with the movements of the heart, and does not cease when the patient holds the breath, as is the case in pleurisy.

Causes.—Cold, inflammation of neighbouring organs as of the pleura and lungs; and pyæmia. Pericarditis is termed **Traumatic** when resulting from a wound,

Rheumatic, when preceded by rheumatic fever, and

Uræmic, if occasioned by kidney disease.

Terminations :

- (1) In Resolution (complete recovery).
- (2) In Adhesions.
- (3) In Hydropericardium.
- (4) In Pyopericardium.

HYDROPERICARDIUM.

In this condition amber-coloured fluid distends the pericardium. It may follow inflammation of the pericardial sac or may occur as the result of kidney disease.

The heart's action is weakened, the pulse is small, feeble, intermittent, unequal, and irregular, and the leading symptoms are faintness, pallor, cold perspirations and the signs of impending death. The effused fluid presses the apex of the heart from between the 5th and 6th ribs up to the 2nd, 3rd, or 4th intercostal space, and the *area of percussion dulness* is continued up the sternum, following the course of the great vessels. On auscultation the heart's sounds are indistinct, and on palpation the impulse is feeble and irregular or wavy. In extreme cases both the cardiac impulse and the sounds may be almost imperceptible. The line of dulness is variable; it is wider upon the patient lying down than when standing. It is also of a pyramidal shape, the apex of the pyramid being above.

Hydropericardium is frequently accompanied by Hydrothorax and general dropsy.

The greater number of cases of Pericarditis terminate

in adhesions, and by some writers this condition is known as

CHRONIC PERICARDITIS,

but the term would appear misapplied, since the pre-existing inflammation merely produces such a condition.

ADHERENT PERICARDIUM.

The existence of this condition can only be assumed after the presence of the "double friction" sound. When there is adhesion to the spine strong jogging action of the heart is observed, and since the organ no longer moves freely in its sac, but both sac and contents move together there is *dragging in of the sternum at the ensiform cartilage*, accompanied by the general symptoms of cardiac embarrassment.

Treatment of Pericarditis.—Chiefly that of acute rheumatism; the salts of potash, salicylic acid, opium, and rest. After effusion has taken place, cupping and leeches will be found serviceable, or blistering over the region of the heart, the blisters being kept open. In extreme cases of hydropericardium as a last resort the trocar and canula (*paracentesis pericardii*) must be employed; but this operation is itself attended by considerable danger.

ENDOCARDITIS.

(*ἐνδον*, within; *καρδία*, the heart; *itis*).

Definition.—Inflammation of the lining membrane of the heart. Endocarditis can only be distinguished by the valvular lesions causing "murmurs."

Causes.—Rheumatic fever, scarlatina, measles, and disease of kidneys.

Symptoms.—Rational symptoms directly pointing to the heart are very obscure.

VALVULAR DISEASES OF THE HEART.

The valves may be the seat of—

(1) Inflammation, giving rise to deposit of lymph upon or beneath the lining membrane. The valves lose their thinness and transparency, they become thick, puckered up, and adherent to one another or to opposite walls of the channel.

(2) Warty vegetation or excrescence.

(3) Atheromatous degeneration.

(4) Calcification (deposit of carbonate and phosphate of lime).

Results.—(1) Valvular obstruction.

(2) Valvular insufficiency (Regurgitant disease).

Both these diseases may co-exist, but they not unfrequently exist separately.

Symptoms:—

Rational Signs.—Diseases of the *left* side of the heart chiefly affect the arterial pulse, giving rise to irregularity and inequality: those of the *right* side affect the venous circulation, causing regurgitation into the jugular veins (the venous pulse).

Physical Signs.—The natural sounds are replaced or accompanied by “murmurs.” The qualities of these murmurs may be harsh, rough, cooing, whistling, musical, etc., but a very loud murmur does not necessarily indicate extensive cardiac disease, nor *vice versâ*.

Murmurs are primarily divided into—

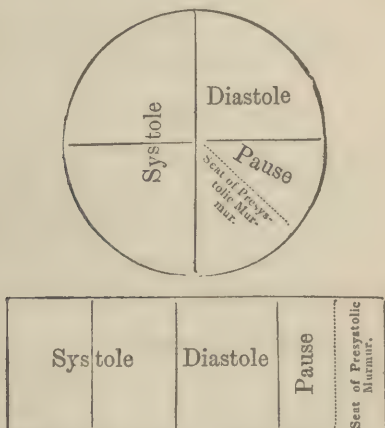
(1) Organic or permanent.

(2) Inorganic, functional, or temporary.

The first name is applied when actual disease of the valves exists, but the second may be produced by a peculiar condition of the blood or of the vessels through which that fluid circulates. Thus in weak anæmic persons it is not uncommon to find a loud murmur over the heart, which is also audible in the carotid and sub-clavian arteries, but this peculiar sound will entirely disappear under the exhibition of the iron salts and upon restoration to health.

Axiom I.—A murmur is *not limited* to any definite spot over the area of the heart, but its diagnostic value depends upon the *place* at which *its intensity is greatest*.

A rhythmic period of the heart's action may be roughly represented as follows :—



The first half of the period is occupied by the **systole** or contraction of the ventricles, during which the first

sound of the heart is heard, the succeeding fourth by the diastole or dilatation of the ventricles, during which the second sound is heard, and the remaining fourth is a period of silence or pause before the next succeeding systole. By a systolic murmur is implied a morbid sound which accompanies the systole, and is almost synchronous with the pulse at the wrist; a diastolic murmur accompanies the diastole. A presystolic murmur is a morbid sound occurring in the last half of the pause, or last eighth of the whole rhythmic period, and immediately precedes the next systole.

Axiom II.—Murmurs heard during the Systole are due to the passage of blood *Out* of a ventricle.

Axiom III.—Murmurs heard during the *Diastole* are due to the passage of blood *Into* a ventricle.

Inorganic murmurs are always systolic, since presystolic or diastolic murmurs always indicate structural disease.

Mitral Obstruction,

Otherwise called "Mitral Stenosis," or mitral constriction, is distinguished by a *Presystolic murmur*, the intensity of which is greatest at the apex of the heart, is faintly audible at the ensiform cartilage, is traceable along the left margin of the organ, and is occasionally heard at the inferior angle of the left scapula.

Mitral Regurgitation

Is recognised by a *Systolic murmur*, loudest at the apex, traceable in the same direction as the foregoing, and nearly always audible at the inferior angle of the left scapula.

The *frémissement cataire*, or purring thrill on palpa-

tion, is a frequent accompaniment of mitral disease, but this physical sign is not peculiar to valvular disease, since it may occur in any condition which produces a deficiency of blood in the heart.

In mitral disease the pulse, if irregular, is usually found to be intermittent, soft, small, and weak.

Of all the diseases of the valves mitral disease is perhaps the most common.

Aortic Obstruction

Is recognised by a *Systolic murmur*, loudest at the base of the heart, *i.e.*, at the second right costal cartilage, and traceable to the right shoulder, following the course of the large vessels. The pulse is usually wiry and resisting, and sometimes visible.

Aortic Regurgitation

Is distinguished by a *Diastolic murmur* in the same position as the foregoing.

In this form of aortic disease there is usually visible pulsation in many distant arteries, and the pulse is jerking; the pulse of unfilled arteries often described as dirotous, *i.e.*, communicating a double impulse.

Tricuspid Regurgitation

Is recognised by a *Systolic murmur* upon the same level as that at which the mitral murmur is heard, but to the right of the ensiform cartilage, and extending downwards to the epigastrium. It may be said to occupy a circular area, of which the ensiform cartilage forms the centre. It is usually found that this con-

dition is associated with dilatation of the right side of the heart, by which condition the tricuspid valves are mechanically spread apart, and the blood is allowed to regurgitate; the valves themselves are not commonly diseased. In this condition there is usually turgescence and pulsation in the jugular veins.

Tricuspid obstruction is so uncommon that its description here is unnecessary.

Pulmonary Valvular Disease

Is so exceedingly rare, that any organic alteration of these valves is a pathological curiosity, and the diagnosis is attended with considerable difficulty; but when a murmur can be traced from the middle of the left edge of the sternum towards the left clavicle, is loudest above the second left costal cartilage, and is inaudible in the subclavian and carotid arteries, we may assume that it originates at the orifice of the pulmonary artery.

Sequelæ of Valvular Diseases. — Dilatation and hypertrophy of the heart; paralysis from softening of the brain substance caused by emboli; dropsy and gangrene of the leg.

In distinguishing exo- or peri- cardial murmurs from endocardial, the following facts must be borne in mind:

The **Pericardial** are more superficial, are always double, are confined to the heart's area, and increased on pressure by the stethoscope.

The **Endocardial** are less superficial, not always double, are propagated to localities beyond the heart's area, and are unaltered by pressure by the stethoscope.

HYPERTROPHY (ὑπερ, over ; τροφή, nourishment) **OF THE HEART**

Is of three kinds, *viz* :—

(1) **Simple Hypertrophy** (thickening of the wall without enlargement of the cavity).

(2) **Eccentric Hypertrophy**, or **Hypertrophy with Dilatation** (thickening of the wall with enlargement of the cavity).

(3) **Concentric Hypertrophy** or **Hypertrophy with Contraction** (thickening of the wall with diminution of the cavity).

The second form is the one usually met with.

Concentric hypertrophy is now believed by most pathologists to be a post-mortem or ante-mortem change, taking place during the act of dying, and occasioned by the slow contraction of the muscular fibres.

Causes.—Overstrain upon the heart, as occurs in violent exercises of any kind, *i.e.*, athletics, running and rowing. Any obstruction to the blood-stream demanding extra work from the heart, as in diseases of the valves, lungs, or kidneys.

Emphysema, chronic bronchitis, and diseases of the left side of the heart will produce hypertrophy of the right ventricle ; obstruction at the aorta will induce a similar condition in the left ventricle, and mitral obstruction induces hypertrophy of the left auricle.

Pathology.—This varies according to each form of hypertrophy. The normal size of the heart is about that of the closed fist, and the mean weight from eight to ten ounces ; the size and weight may both be enormously increased. The shape of the hypertrophied organ is globular, its substance stiff and hard on section,

and the walls do not collapse when emptied of blood. The whole heart may be hypertrophied, or one or more of its cavities may be so affected. The left ventricle appears to be the most common seat of the affection.

Symptoms of simple hypertrophy :—

Rational Signs.—The pulse at first is usually full and strong, but after a variable period it may become altered, and it is not uncommon sooner or later to find it small and feeble, even with a bounding heart.

Since hypertrophy seldom exists alone it is usual to find symptoms varying according to the complications.

Physical Signs :—

Percussion.—When the right ventricle is chiefly affected, which is by no means common, the apex may be entirely formed by it, and the area of the heart is square; when the left ventricle is the seat, which is more often the case, the percussion area is elongated.

Palpation.—The cardiac impulse is greatly increased, slow and heaving.

Inspection.—When the left ventricle is the seat of disease, the apex beat is below the normal position, and there is violent pulsation in the carotids. When the right ventricle is chiefly affected the apex extends outwards, and there is pulsation at the epigastrium, often accompanied by swelling and pulsation in the jugular veins.

Auscultation.—The first sound is prolonged and indistinct, the second is lower in pitch than it is normally, and when the right ventricle is most affected, this second sound is louder over the pulmonary than over the aortic valves.

Roughly speaking, then, cardiac hypertrophy is recog-

nised by the increased impulse of the heart, and the diminished audibility of its sounds.

DILATATION OF THE HEART

Is of three kinds, viz. :

(1) **Simple Dilatation** (enlargement of the cavity, with normal thickness of the walls).

(2) **Dilatation with Hypertrophy.**

(3) **Dilatation with Thinning of the Walls.**

Causes.—Any cause preventing the complete evacuation of any of the heart's cavities; diseases of the valves, and emphysema. In aortic regurgitation the left ventricle becomes dilated. Both ventricles may be affected together or separately.

Symptoms of simple dilatation :

Rational signs.—The pulse is feeble, small, intermittent, and irregular. There is extreme palpitation, blueness of the face and lips, and dropsy.

Physical signs :

Percussion.—The cardiac area is more square than normal, since the cavities are increased in capacity.

The right side of the heart is more frequently the seat of dilatation than the left side.

Palpation.—There is great diminution of the cardiac impulse, which is sometimes wavy and almost imperceptible.

Inspection.—The apex beat is lower than normal.

Auscultation.—The audibility of the heart sounds is much increased, the first sound being clear, sharp, and short, and similar to the natural second sound.

Roughly speaking, cardiac dilatation is recognised by the diminution of the impulse of the heart, and the increased audibility of its sounds.

Sequelæ.—The lungs and liver may become congested, and disease of the cardiac valves, especially of the tricuspid, is induced.

Hypertrophy and dilatation usually co-exist. When the former is greater than the latter the cardiac dulness is increased from above downwards, but when the dilatation is greater than the hypertrophy the dulness is greater transversely.

So long as the hypertrophy keeps pace with the dilatation the patient is in comparative safety, since the former condition must be regarded rather as a compensation of nature than a morbid condition, but as soon as the dilatation acquires preponderance the condition is excessively dangerous.

FATTY DISEASE OF THE HEART.

Fat is naturally deposited about the heart, and an excess of this substance is called a *fatty infiltration*, i.e., fat is deposited in large quantities upon and between the muscular fibres. In this condition the functions of the heart do not appear to be much interfered with.

FATTY DEGENERATION.

Here the muscular fibres are *replaced* by fat, and pathologically the heart appears of a pale yellow colour and feels soft and greasy; under the microscope the sharp edges and striæ of the muscles are lost, and the tissue appears loaded with oil. This condition is usually met with in old or middle-aged persons, and is often associated with other diseases of the heart and arteries. Positive diagnosis may be considered almost impossible, but there will be feebleness and intermittency of the pulse, and cardiac impulse, and the patient

suffers from the most distressing palpitation or even syncope upon the least excitement. It has been stated that the arcus senilis, or white ring round the cornea, is an indication of the fatty heart.

MYOCARDITIS (*μῦς*, a muscle; *καρδία*, the heart),

Or inflammation of the substance of the heart, is very rare, as an uncomplicated condition, but may accompany pericarditis.

Pathologically the muscle is soft and dark red or hard and dense, and under the microscope the transverse striæ appear lost, the muscle apparently consisting in the main of fatty and granular matter.

Symptoms.—All the symptoms are uncertain, but the disease is said sometimes to terminate in abscess or to produce dilatation.

CANCER OF THE HEART

May occur as a part of the cancerous cachexia, or from the extension of cancerous disease from other organs. is purely pathological.

TUBERCLE OF THE HEART

May occur as a general condition, chiefly in the tuberculosis of children. This is also purely pathological.

CYANOSIS (*κύανος*, blue, *νόσος*, disease); or, **MORBUS CÆRULEUS.**

By this term is implied a blue discoloration of the skin, chiefly confined to early life and arising from some deficiency in the construction of the heart, *viz.* :

(1) Permanence of the foramen ovale, permitting the passage of blood between the auricles.

(2) Abnormal apertures in some part of the septum of the auricles or ventricles.

(3) Origin of the aorta and pulmonary artery from a single ventricle.

(4) Extreme contraction of the pulmonary artery.

(5) Origins of large vessels of the heart being transposed, the pulmonary artery arising from the left, and the aorta from the right ventricle.

(6) Continued patency of ductus arteriosus, allowing the mixture of bloods of the pulmonary artery and aorta.

Sufferers from this disease usually exhibit symptoms of coldness of the body, palpitation, fits of dyspnoea, frequent liability to syncope and dropsical effusions.

FUNCTIONAL DISTURBANCES OF THE HEART.

PALPITATION (Palpito, I throb).

Although this may be only a functional derangement, yet at times it is a symptom of organic disease of the heart.

Symptoms.—There are frequent, strong, tumultuous movements of the heart without any ascertainable organic lesion. When very severe the heart-beats may be heard and felt by the patient. These symptoms are often accompanied by a distressing sensation of sinking at the pit of the stomach.

Causes.—The nervous temperament; any strong mental emotions; excessive loss of blood; dyspepsia

with flatulence; intemperance; the abuse of tobacco; want of sleep. It is very common in chlorosis.

Treatment.—For regulating the circulation digitalis combined with tonics is specially indicated, and for the relief of debility the salts of iron appear most beneficial. A belladonna plaster to the side often affords relief.

SYNCOPE (*συγκόπτω*, to cut down).

Symptoms.—There is a sensation of intense distress, buzzing in the ears, failure of the eyesight, objects appear to swim before the eyes. The lips become blanched, the face pale, the surface of the body is covered by cold perspiration, the senses fail, and the sufferer falls senseless to the ground, the pulse and breathing becoming imperceptible. Recovery is indicated by a deep protracted sigh. The attacks usually last only for a short time.

Causes.—Debility and nervous irritability; profuse discharges, especially of blood; severe pain and mental emotion.

Treatment.—The recumbent posture, bringing the patient into the fresh air, and dashing cold water over the face and breast.

ANGINA PECTORIS (*ἄγχω*, to strangle; *pectus*, the breast).

This is *apparently* a disease of the heart; it may be termed a kind of neuralgia of the heart and an affection of the phrenic and perhaps the pneumogastric nerves. The attack has been supposed to be caused by spasmodic contraction of the small pulmonary and systemic vessels.

Symptoms.—There is pain in the region of the heart extending to the left side or to the shoulder down the left arm and even to the fingers, and accompanied by a sensation of suffocation and fear of impending death. The heart's action is often irregular and intermittent, the pulse feeble and the body covered with cold sweat. The attacks occur in paroxysms at uncertain intervals, and may be associated with organic cardiac lesions, but not necessarily. They sometimes occur without warning, sometimes when quickly walking up a hill. The attacks generally last only for a few seconds, but they may be prolonged even to an hour. Angina pectoris used to be regarded as a terribly fatal disease, but, when uncomplicated, it is not now so regarded, and patients have been known to suffer from the complaint for many years and then to die of some other affection.

Causes.—Not precisely known, but affections of the valves of the heart, fatty degeneration, and calcification of the coronary arteries have all been stated to produce this affection, which, however, then becomes only a symptom.

Treatment.—Sedatives, as opium; stimulants and anti-spasmodics; brandy and ammonia, often afford relief, and a belladonna plaster to the side will be found serviceable. The last remedy proposed is nitro-glycerine.

THE GENERAL TREATMENT OF ENDOCARDITIS AND VALVULAR DISEASES.

A principal point that demands attention in these diseases is the management of the acute rheumatism which either accompanies or precedes them; if this affection can be effectually controlled, the supervention of cardiac inflammation need not be apprehended.

Bleeding, at one time, found much favour, but it is never resorted to in the present day, and *purging by strong cathartics and salines*, which was once supposed to be beneficial, is now seldom practised.

Calomel was once strongly recommended, but it certainly has no effect in neutralising the poison of acute rheumatism, and its administration is, therefore, quite useless, if not injurious.

Low diet should be enjoined until the generation of the poison has ceased and the function of nutrition begins to be carried on normally.

Nitrate of potash was advocated some years ago by Dr. Basham, but subsequent experience has not confirmed his favourable results.

Lemon juice appears to exercise a very beneficial influence in the treatment of acute rheumatism.

Blisters to the inflamed joints have found much favour with Dr. Herbert Davies, who is of opinion that the heart may, by this remedial measure, be saved from inflammatory mischief, the pains in the joints being relieved, the rapidity of the pulse diminished, rapid convalescence promoted, and the blood relieved of the *materies morbi*.

Cold to the affected joints has been followed by relief. The whole body has of late years been plunged into cold water in cases of acute rheumatism, but the wisdom of this proceeding is doubtful.

Propylamine and *Trimethylamine*, two metameric bodies, each having the chemical characters of an ammonia—the latter being obtained from herrings' brine—have been employed by Dr. Dujardin-Beaumetz, of Paris, who states that by their means benefit may be obtained in the short space of twelve hours.

The *Cyanides* of *zinc* and *potassium* are highly

recommended by Dr. Luton, of Rheims. It is possible that the efficacy of these salts may be due to the generation of prussic acid in the stomach.

The *Alkaline Treatment* by potash and its carbonates is, upon the whole, the most satisfactory. Dr. Dickinson has shown that of 48 patients subjected to full alkaline treatment only one had pericarditis commencing after the treatment had begun.

The *Bicarbonate of potash* should be given in tolerably large and repeated doses (1 drachm every 4 hours). If it does not act as a specific, it neutralises extreme acidity. Lemon juice may be combined with the bicarbonate, whereby a citrate of potash is formed, which is reconverted in the system into carbonate. The juice of six lemons may be given daily.

Opium in all its forms is very useful. Pretty large doses are required—1 to 2 grains may be given every day or twice a day, or even oftener, or an equivalent dose of the tincture or of the morphia salts. If there be any objection to opium, henbane, in the form of extract or tincture, may be substituted in doses of 5 grains, or of $\frac{1}{2}$ a drachm to 1 drachm of the tincture.

The diet is very important. This should consist of milk and water with weak beef-tea. A moderate amount of alcoholic drinks may be allowed, such as gin mixed with the lemon juice, pure brandy or pure whisky, light claret and hock, cream of tartar, seltzer water, and especially potash and lithia water. The latest internal remedy that has been employed is *Salicylic Acid*, which appears to have great influence in reducing the temperature.

In the treatment of valvular disease all powerful exercises, as running, riding, rowing, dancing, or any means by which dyspnœa may be caused, must be

avoided ; the diet should be light, and should consist of soup, eggs, poultry, game, light wines, dry sherry, and bitter ale.

Digitalis possesses a remarkable power of regulating the action of the heart, strengthening the organ when force is insufficient, and diminishing activity when it is excessive. It is useful in nervous palpitation, when the heart is either too weak or too strong, and in the former case it is often advantageously combined with iron. The apparently paradoxical action of *digitalis* is explained by the supposition that the drug causes contraction of the muscular fibres of the heart, equalising the movements of that organ and other parts of the circulatory apparatus.

Digitalis co-operates with **Hypertrophy** in assisting the driving power of the heart, and acts similarly in **Dilatation**, though not so successfully. A comparatively small dose is required in hypertrophy, a much larger one is tolerated in dilatation.

In **Mitral Obstruction**, *digitalis* proves beneficial by assisting the driving power of the heart, especially of the right ventricle.

In **Mitral Regurgitation**, *digitalis* is also useful by assisting the hypertrophy of the right ventricle.

In **Aortic Obstruction** nature generally does all that is needful, but *digitalis* may be employed as an adjunct ; when the hypertrophy is adequate to the task, small doses generally suffice, since large ones may cause over-contraction.

In **Aortic Regurgitation** the efficacy of *digitalis* is more than doubtful. Dr. Fothergill considers its administration hazardous, since it may drive the ventricle into a state of contraction, from which it may never become relaxed.

Tricuspid Regurgitation is generally associated with a dilated right ventricle, and therefore digitalis is utterly useless, since there is no counteracting hypertrophy.

Tricuspid Obstruction is exceedingly rare, and we have no experience either to justify or to reject the use of digitalis. The diuretic action of the drug renders it exceedingly useful in relieving the dropsy which is often attendant upon the valvular affection.

The dose of tincture of digitalis is from 10 to 15 minims in aromatic water, repeated two or three times a day; of infusion of digitalis, half an ounce may be combined with expectorants, when the lungs are congested or inflamed, and with diuretics, as the salts of potash, if dropsy supervene; and digitalis may be very usefully combined with iron when the powers of the system are much reduced.

DISEASES OF THE BLOOD-VESSELS.

THROMBOSIS AND EMBOLISM.

A thrombus is a coagulum which forms in some parts of the vascular system. It usually occurs in one of the heart's cavities, or in a vein, but it may arise in an artery, as is the case with an aneurism. It may be caused by endocarditis, through the roughening of the lining membrane, with which it comes in contact, or it may ensue from the current of blood being retarded. A thrombus may become organised, blood vessels being developed in it, in which case it is ultimately converted into connective tissue, and adheres closely to the vessel in which it arises; or the thrombus may soften, breaking up into a pulpy mass, which microscopically

presents fat globules, altered blood corpuscles, and granular matters.

An embolus is the term given to that portion of a thrombus, or of an excrescence, which becomes detached from the valves of the heart, and being driven on by the blood, at last meets with a vessel the calibre of which will not admit of its passage, and in which it therefore becomes fixed.

Foreign matters introduced into blood induce coagulation on their surface, such as solid metallic bodies, Iron, Mercury, Pus, etc. A clot of fibrine in the blood-vessels tends to increase by addition, layer upon layer.

Thrombosis may be caused by phlebitis, arteritis and endocarditis from solid exudations from the inner surfaces of the membranes. A film of coagulum being formed upon a roughened and inflamed surface, layer upon layer is deposited, and it in time becomes a thrombus, one portion being attached and the other freely vibrating in the circulating fluid ; portions will become detached, and at length meeting with a vessel whose calibre will not allow passage, an embolus is formed.

The thrombus may reach from one side of a vessel to the other, and obstruct the passage of blood from below. Hence pouch-like dilatation and aneurism. Pus may be formed in the centre of a thrombus, and hence pyæmia. When a coagulum has formed in the right side of the heart the pulmonary circulation is most liable to be affected ; when the mitral and aortic valves are the seat, the cerebral vessels are liable to be obstructed ; when those organs the blood of which is returned by the portal vein, the liver may be obstructed.

When the blood-stream is obstructed by an embolus, the functions of the parts thus robbed of their nourishment are destroyed.

Paralysis may occur if a portion of the brain becomes anæmic by the pressure of an embolus. Congestion occurs in the surrounding vessels, and generally hæmorrhage takes place, unless the circulation is carried on through collateral branches, in which case the injury will only be temporary. Softening or suppuration takes place in the structures which are permanently deprived of blood. The brain is most frequently the seat of softening, since the emboli which impede its circulation are derived from the heart. In the liver and lungs, suppuration is more common, in consequence of the clots by which their vessels are obstructed being as a rule derived from veins obstructed by decomposing blood.

ANEURISM — AORTIC (*ἀορτή*, the great artery, *ἀνευρίνω*, to dilate.)

Varieties :

(1) **True Aneurism** ; all the coats of the artery dilating and uniting to form the walls of the pouch.

(2) **False Aneurism** ; the inner and middle arterial coats becoming ruptured, the walls being formed by the cellular coat and the surrounding parts.

(3) **Consecutive or Mixed Aneurism** ; the three coats having first dilated, the middle and inner ones, as the distension increases, becoming subsequently ruptured.

(4) **Dissecting Aneurism** ; when the two inner coats are ruptured and the blood forces itself by a false passage between them and the outer coat.

(5) **Varicose Aneurism** ; when communication has taken place between the aorta and pulmonary artery, or between the aorta and either of the venæ cavæ, or

between the aorta and the right ventricle, or the aorta and even the auricles.

Causes.—Aneurism of the aorta is usually confined to advanced life. It may be caused by calcareous, atheromatous or fatty degeneration of the vascular coat. When the aneurismal tumour is of small size, it is seldom detected.

Termination.—In death from hæmorrhage, due to rupture of the sac, or in sudden death without rupture, as if from suffocation. Gradual sinking from exhaustion, resulting from the protracted suffering. Debility, due to repeated loss of small quantities of blood, or from accompanying pulmonary phthisis.

ANEURISM OF THE THORACIC AORTA

Is chiefly observed in the ascending portion or transverse part of the arch, but it may occur at the roots of the large vessels arising from the arch.

Symptoms.—These are the same as those produced by any tumour in the chest of equal size, viz. :

Dyspnœa, with more or less solidification of the lung in consequence of the pressure of the aneurismal tumour; harsh cough, with or without expectoration, from pressure upon the bronchi.

Dysphagia, by pressure on the œsophagus.

Aphonia and *spasmodic constriction of the glottis*, from tension of the inferior or recurrent laryngeal nerves.

Neuralgia of the back, with *Paraplegia*, by pressure on the spine, succeeded by absorption of the vertebræ.

Venous Obstruction, in extreme cases accompanied by dropsical effusion into the areolar tissues of the neck, chest, face and upper extremities, by pressure upon the large venous trunks.

Inanition, by pressure upon the thoracic duct, has been also stated to result from aneurism.

Thoracic aneurism is difficult to recognise if the tumour is of small size, or involves the orifice of the aorta.

It is comparatively easy to recognise when the arch of the aorta or any of its branches is the seat of mischief, or when it has increased sufficiently to rise out of the chest; and the diagnosis is certain when the tumour causes the ribs or sternum to protrude, or leads to their absorption, especially when there is a strong heaving impulse over the tumour, and thoracic dulness in proportion to its extent. A peculiar thrilling sensation on palpation, and a rapid thrilling pulse, are sometimes present, and a bellows murmur may be heard in the locality of the tumour; but this sound must not be considered diagnostic unless confirmed by other symptoms, since it may be caused by the pressure of any tumour upon the large vessels at the base of the heart. When the arch of the aorta or the large vessels of the neck or upper extremities are the seat of the tumour some notable inequalities in the pulsations of the carotid and radial arteries may be found. Occasionally the pulse at the wrist, or in one or both carotid arteries, is absent; giddiness, fainting, and indistinct vision indicating disturbance of the cerebral circulation may sometimes appear. In the absence of symptoms of pulmonary phthisis, or of obstruction in the portal circulation, etc., hæmoptysis or hæmatemesis will be of additional importance in the diagnosis of aneurism. With a large tumour dulness on percussion and bronchophony may be present, according to the extent to which the lung is compressed.

Treatment must consist in perfect rest and moderate

diet; the bowels kept freely open; digitalis in small and repeated doses may be exhibited, or a belladonna plaster may be applied to the side; treatment must also be directed to the accompanying symptoms as they arise.

ANEURISM OF THE ABDOMINAL AORTA.

Symptoms.—These will vary according to the situation and the size of the tumour, and the viscera upon which pressure is exercised.

If the *Stomach* be pressed upon, severe dyspeptic symptoms arise;

If the *Bowels*, violent colic or obstinate constipation;

If the *Nerves of the Solar Plexus*, neuralgic pains;

If the *Spinal Nerves*, severe pain in the abdomen, loins or lower extremities, resembling rheumatism, psoas, or lumbar abscess, disease of the spine or sciatica. When the rectum has been pressed upon, stricture of that part has been suspected, and abdominal aneurism has been mistaken for hepatic, splenic, or renal disease. When the upper part of the abdominal aorta is the seat of the tumour, the diaphragm may be pushed up, and dyspnœa and other pulmonary symptoms arise. The tumour, if carefully examined, may frequently be found in the situation of the aorta; it will be felt to pulsate strongly, the peculiar thrill is present, and the stethoscope will detect a bellows murmur. The pulsation over an aneurismal tumour is diffused more uniformly than over any other abdominal tumour seated in front of the aorta; the bellows murmur is also harsher, and of a more grating character than that occasioned by such tumours. A healthy aorta may, however, communicate pulsation to a loaded intestine or other kind of tumour lying over it.

DISEASES OF THE LIVER.

HEPATIC CONGESTION.

This affection of the liver occurs under three forms, viz. (1) *Active*, (2) *Passive*, leading to (3) *Biliary Congestion*, (a condition in which the ducts are engorged with bile).

The **Active** form arises from an excessive supply of blood to the organ, resulting from intermittent fever, excess in eating and drinking, or from residence in tropical climates. It may also be caused by morbid materials in the blood, or by the suppression of habitual discharges (catamenial or hæmorrhoidal), or by sedentary habits.

The **Passive** form may occur from obstruction to the circulation through the portal and hepatic veins, or from obstruction of the blood-flow into the heart, due to dilatation of the heart or valvular disease; from emphysema and other diseases of the lungs, in which the venous blood-flow through the right side of the heart is obstructed; but blows on the side, and intemperance, especially when spirits have been freely indulged in, are common causes, of hepatic congestion. It may precede or accompany cirrhosis and other diseases of the liver.

In the first two forms the liver is enlarged, its surface is smooth and dark red, with a hard and prominent margin, and on section blood flows freely. The so-called "nutmeg liver" (black spots upon a yellow base) is the result of long-standing congestion.

Biliary Congestion usually gives rise to jaundice.

Symptoms.—There is slight tenderness over the liver, the surface of which is smooth; pain and weight in the right hypochondrium, pain of a gnawing character, referred to the right shoulder, headache, vomiting or nausea, foul tongue, slight jaundice, anorexia and constipation; fever is absent.

In pleuro-pneumonia of the right side, similar symptoms to the above are not unfrequently observed.

In **Chronic Congestion**, the same symptoms are developed, but they are generally much less severe.

Treatment.—In the **Active** form: remove the cause, enjoin plenty of exercise and plain diet, as white fish, weak tea, rice; give aloetic purgatives, liquor potassæ, followed by simple tonic infusions—senna, jalap, and podophyllin are, with small doses of mercury, occasionally very useful, and nitro-hydrochloric acid is of great service.

In the **Passive** form, sulphate and carbonate of magnesia, sulphate of soda and sulphuric acid, aloes, senna, sulphate of iron and magnesia, leeches to the anus, and certain mineral waters—those of Carlsbad, Harrogate, etc.—simple diet, avoidance of stimulants.

ACUTE HEPATITIS (*ἥπαρ*, the Liver; *itis*).

Definition.—Inflammation of the liver substance.

This disease is very rare in England, but is common in tropical climates. It is usually met with in this country only as

PERI-HEPATITIS,

or inflammation of the peritoneal investment of the organ. It is generally accompanied by adhesions to neighbouring organs, and may occur with general peri-

tonitis, or result from the irritation of an abscess of the liver, or from an hydatid or a cancerous tumour.

Symptoms.—High fever, sometimes of a very severe character, and preceded by rigors. There is enlargement of the organ, with fulness of the right hypochondrium; pain in the hepatic region of greater or less intensity, aggravated by pressure, cough, or deep inspiration; inability to lie upon the left side. Jaundice is usually present, with dyspnoea, vomiting and hiccough. There is sometimes pain in the shoulder of a gnawing, aching character. These symptoms may, however, be absent in some cases, and the first indication of the disease may be the bursting of an abscess into the lungs or œsophagus, or distinct fluctuation on palpation.

Causes.—Inflammation of the pleura by extension downwards; mechanical injury; suppurative inflammation of a vein, by which the blood is contaminated with pus; hot climates and marsh fever, in which the functions of the liver become deranged; ulceration of the intestines, of the gall bladder or gall ducts; spirit drinking.

Terminations:—(1) In Resolution; (2) In Diffused Suppuration; (3) In Circumscribed Abscess; (4) In Gangrene. When the inflammation is spread pretty generally over the whole liver, softening or induration may result. When it is more circumscribed, and this is more common, then abscess frequently follows.

HEPATIC ABSCESS,

Besides being the result of hepatitis in hot climates, is generally observed either—

(1) Connected with Disease of the Colon. or

(2) Resulting from Pyæmia.

In the first case the abscess is usually single and large, the pus being surrounded by ragged, softened liver substance, or enclosed in a thick, tough membrane.

In the second case small abscesses are observed in the course of the portal veins.

When an hepatic abscess is single, it usually selects the right lobe of the organ. It may burst externally, or into the peritoneum, into the chest, or the canal of the intestine, or the pus may dry up and leave a cheesy mass.

The single abscess is generally the result of acute inflammation, but when pyæmia precedes, then numerous purulent deposits are occasioned. Solitary abscess is very rare, except from residence in the tropics, or in persons subject to dysentery, but when it does take place there may be bulging, tenderness on pressure, and obscure fluctuation over some part of the liver region; yet, in some cases, physical signs are wanting, and the diagnosis can only be a matter of conjecture.

Multiple pyæmic abscesses may result from wounds or surgical operations, from internal abscess or ulceration of the pancreas, stomach, or intestines.

Hepatic suppuration is frequently preceded by dysentery, since the foetid contents of the large intestine, or the pus occasioned by their ulceration, are absorbed and rapidly carried to the liver.

Other causes of abscess are ulceration of the rectum, bladder and vagina.

Abscesses of the liver are sometimes of great size, and have been known to contain pints of pus. They may open into the peritoneum and set up fatal periton-

itis. It is not unfrequent to find, however, that adhesive inflammation is set up in the portion of peritoneum immediately above the purulent surface, and the effused lymph glues the organ to the parts adjacent. The determination of abscess is towards some opening; it may point in various directions—to the chest, or abdominal parietes, or posteriorly, or internally into the intestines, the windpipe or the œsophagus.

The formation of abscess is indicated by chills or distinct rigors, hectic fever, and gastric disturbance. There is pain with extreme tenderness on palpation, and tension of the abdominal muscles; emaciation, dysentery or diarrhœa.

Pathology of hepatitis :—

(1) There is great **Congestion** of the capillaries of the liver, with consequent swelling.

(2) Then effusion of **Albumino-Fibrine** or **Plastic Lymph** takes place.

(3) The attack ends in (a) **Resolution**, with absorption of the exsudate, (b) in **Purulent Infiltration**, (c) in **Abscess**, (d) in **Gangrene**.

Treatment of acute hepatitis :—

Salts of soda and potash, and salines generally, leeches, calomel, blue pill, ipecacuanha, fomentations, restricted diet, and complete rest in bed.

After **Suppuration**; bark and ammonia, mineral acids, nitro-hydrochloric acid, quinine, opium, wine, and nourishing food.

Puncture should be made with the trocar and canula or aspirator, if the surface of the abscess is adherent to the abdominal parietes.

HYPERTROPHY OF THE LIVER.

Definition.—Simple enlargement of the liver ; it is not a very common disease.

Symptoms :—

Rational Signs.—None are diagnostic.

Physical Signs.—On palpation the liver is felt to be enlarged. On **percussion** the area of hepatic dulness is increased.

Causes.—Long continued congestion from residence in tropical climates or malarious districts, and as a result of intermittent fever.

Hepatic Hypertrophy may be associated with phthisis, dysentery, saccharine diabetes, and leucocythemia.

A portion of the gland may be rendered useless by disease, and the cells of the healthy parts then become enlarged, preventing systemic derangement ; this partial hypertrophy is then of a compensatory nature.

Terminations.—Not a fatal disease, but curable by appropriate treatment.

Pathology.—A simple enlargement characterised by an increase in the secreting cells, which may be either multiplied in number or increased in size.

Treatment.—Painting with iodine, and the use of iodide of potassium internally, since this latter promotes the absorption of tumours generally.

The *edge* of the liver should be felt from time to time to ascertain if the organ is diminishing in size.

ACUTE YELLOW ATROPHY.

This is a rare disease, to which women are more liable than men, and young persons more so than old ; pregnancy appears to be a predisposing cause.

The leading symptoms are the following: jaundice, diminution of the area of hepatic dulness, pain in the epigastrium, vomiting (sometimes of blood), headache, delirium, coma, rapid pulse, obstinate constipation, thirst, a dry brown tongue, hæmorrhage from the nose, stomach, bowels, or uterus. In an early stage the amount of urine is considerably diminished. There is extravasation under the skin, consisting of petechiæ or ecchymoses. It is a very rapidly fatal disease, usually running its course in about a week. The disease is very often not discovered until after death, and the causes are unknown, but it is supposed to depend upon a deficiency of nourishment.

Two ingredients are found in the urine, and are almost characteristic, viz. :—

(1) Leucine ($C_6H_{13}NO_2$).

(2) Tyrosine ($C_9H_{11}NO_3$). These substances are obtained by treating the urinary residue with alcohol.

Leucine when pure separates in "gland-like masses of leaves or scales (also like balls) whose contour is difficult of determination."

Tyrosine forms an adhesive mass consisting of "shining long needles clustered together."

Concentrated urine should be digested with cold absolute alcohol, and the residue treated with boiling spirits of wine; the leucine becomes deposited on evaporation. The liver leucine crystallises in little balls or spheres, in some of which a "radiated stellar arrangement" may be detected. Some authors regard leucine as a product of the too rapid destruction of tissue. Tyrosine is found wherever leucine occurs. Tyrosine with perchloride of iron free from acid gives a dark rich violet colour. Hoffman says "that nitrate of protoxide of mercury added to a boiling aqueous

solution of tyrosine, causes the precipitation of red flakes, the clear liquid being of a deep pink or dark red rose colour."

Pathology.—The liver is reduced in size; it is of a greenish-yellow colour, soft and flaccid. Microscopically the lobules are indistinguishable, the hepatic cells have disappeared, and are replaced by a mass of pigment, granular matter and oil globules. The spleen is also usually enlarged. There appears to be a complete and rapid disintegration of the hepatic cells throughout the whole extent of the gland.

Treatment.—Probably useless. The usual remedies employed are purgatives, followed by the mineral acids, with diffusible stimulants, large doses of quinine, and cold drinks.

CIRRHOSIS (*κίρρωσις*, yellowish).

Definition.—An affection of Glisson's capsule (the fibrous investment of the hepatic vessels surrounding them, entering with them into the substance of the liver, and accompanying them to their ultimate ramifications in the organ).

Symptoms :

Rational signs.—These are generally obscure and insidious; the only indications present may be dyspeptic symptoms, such as nausea, retching and vomiting in the morning, aversion to food, and craving for stimulants, flatulence and irregular bowels; the skin is of a brownish hue, and there is probably emaciation. The urine is thick, and often contains lithates, and there may be some dull pain in the right hypochondrium. If hæmatemesis occurs in addition to these indications, it may be regarded as almost diagnostic, and should ascites

supervene, the nature of the disease is certain. Epistaxis is an occasional symptom, and the bleeding from the nose has sometimes been very considerable.

Physical Signs.—In the early stages of the disease the organ may be found enlarged on percussion and palpation, and the edges rounded, but in course of time the liver shrinks, and the edges will not be found at all.

No symptoms are conclusive until the occurrence of ascites (abdominal dropsy), which is often the only diagnostic or pathognomonic sign of the disease. Roughly speaking, then, the leading characters of cirrhosis of the liver are, dyspeptic symptoms, followed by hæmatemesis and terminating in ascites.

There is no equivalent English term for cirrhosis; it has sometimes been termed the gin-drinker's liver, but it has occurred in persons in whom there has been no history of drinking. By some authors it has been termed chronic hepatitis. Jaundice, although it does occur, is never well marked, and only appears very late in the disease; the duration of cirrhosis is about twelve months, or even more.

Terminations.—Usually fatal, unless arrested early, death ultimately resulting from a weakened condition of the system.

Pathology.—In health, the hepatic artery conveys the nutrient blood to the liver, the hepatic duct carries away the bile, the portal vein conveys blood from the viscera to form the bile, and the hepatic vein carries from the liver the waste blood; but in cirrhosis there is a fibroid hypertrophy of the capsule of Glisson, and, therefore, thickening and hardening of the liver, the edges of which become rounded, and the surface nodulated (hobnailed).

In the early stages of the disease the organ becomes enlarged, but it eventually becomes shrunken and shuts off the supply of blood by the hepatic artery, producing atrophy and pallor; this contraction of the liver obstructs the circulation through the portal vessels, producing enlargement of the veins upon the surface of abdomen, and by compression upon the portal vein induces ascites, for since the blood stream is thrown back upon the intestines, no absorption takes place, and watery fluid is thrown out into the peritoneum. From pressure upon the hepatic duct the bile flow is arrested, and this fluid is not properly secreted.

Microscopically the secreting cells are disintegrated, there is a multiplication of the fat cells, an increase in the colouring matter, and deposit of granular matter. The spleen may be enlarged, and hæmorrhage may occur from congestion of the mucous membrane of the stomach and bowels.

Treatment.—This should consist at first in alleviating the dyspepsia by plain food, sulphate of magnesia, podophyllin, mercury in moderation, nitro-hydrochloric acid, and certain mineral waters, etc. When the malady is thoroughly established, nitro-hydrochloric acid, nux vomica, bitter tonics and rhubarb are indicated, and iodine inunction may be sometimes beneficially employed. For the ascites, the indications are squills, digitalis, scopolarium, the potash salts, and elaterium, pulvis jalapæ compositus, nourishing food, milk, raw eggs, and stimulants in moderation; and as a last resource, paracentesis abdominis. Cupping and leeches should be avoided, and mercurials should be cautiously used, especially calomel, since this drug promotes cell disintegration.

HYDATID TUMOURS (*υδαρίς*, a vesicle).

Hydatids are more common in the liver than in any other organ. They are sometimes met with in the spleen, omentum, brain, and uterus, and often attain an enormous size. The whole affected organ is enlarged, and the enlargement is *not* uniform, the increase being greatest near the affected part. The liver structure is quite healthy.

A hydatid consists of a sac lined by a thin bladder or cyst, which is filled with a limpid, colourless fluid, in which float numerous smaller cysts called acephalocysts, similar to the cyst lining the sac, and varying in size from that of a pea to a pigeon's egg. These cysts contain the echinococci which are developed from the ova of a tape-worm (*Tænia Echinococcus*), which infests the intestines of the dog.

Each echinococcus is an oval-shaped animalcule having about 34 hooklets arranged in a circle round its head, and when the creature is viewed with the head retracted, the circle of hooks appears like a ring in the centre of the body.

It is supposed that the ova are expelled with the fæces of the dog, and find their way into the human economy through the food and drink. It is unknown how they enter the liver and other organs.

Symptoms of hepatic hydatid:—

Rational signs.—None of these are diagnostic. There may be a little local pain, but very little constitutional disturbance.

Physical signs.—There is enlargement and fluctuation, and the "hydatid thrill." This thrill or vibration is found by percussion when the hydatid is near the surface, and is recognised by a trembling sensation

communicated to three fingers of the left hand placed flat upon the tumour, the back of the left middle finger being sharply struck by the tip of the middle finger of the right hand.

Terminations.—Not usually fatal, unless opening into one of the principal cavities. Hydatid tumours may compress the portal vein or vena cava, causing ascites and œdema of the legs. They may burst into the peritoneum, producing peritonitis, or into the lungs or intestines or abdominal wall. In the two latter cases the contents will be entirely discharged, and the sac closing up leaves the patient well. Sometimes recovery takes place by the secretion of a thick putty-like matter within the sac which chokes the hydatid.

Treatment of hepatic hydatid.—Iodide of potassium; electricity; common salt; removal of the contents; tapping; injection of iodine solution, a drainage tube being subsequently inserted.

HEPATIC CARCINOMA.

The liver may be the seat of every variety of cancer, but the soft form (medullary) is more common than the hard (scirrhus).

Symptoms.—There are the general signs of malignant disease (the cancerous cachexia). The patient is feeble, anæmic, sallow and emaciated; the pulse is weak; there is absence of fever; jaundice may be present, caused by the pressure of enlarged cancerous glands upon the common bile duct. In cancerous jaundice the skin may be of a very deep yellow or even greenish-brown colour. There may be severe pain with tenderness on pressure in the right hypochondrium or epigastrium.

Hepatic Cancer is frequently associated with cancer

of some other organs, as the uterus, breast, or stomach, and with enlargement of the cervical glands. Dropsy of the abdomen and legs is occasionally, though rarely, present. The liver is enlarged, the enlargement not being uniform, but uneven, and bulging prominences may be detected. Cancer of this organ is usually circumscribed, presenting itself as a tumour or tumours varying from the size of a pea to that of a child's head.

In **Medullary Sarcoma** of the **liver** the enlargement is considerable, soft and doughy, and may communicate to the hand a feeling of fluctuation.

In **Scirrhus** of the **liver** the enlargement is hard and knobby, slight projecting nodules being scattered through the organ. It is distinguished from cirrhosis, since it does not so commonly lead to atrophy or dropsy.

Terminations.—Always fatal. Tumours are often found adherent to the diaphragm or abdominal wall, since local peritonitis is frequently set up in the vicinity of the tumours, by which means adhesions take place between them and surrounding organs. The disease is rare under 40 years of age, and death usually takes place within a year.

Treatment.—Treat the symptoms.

Hypodermic injections of morphia afford the most relief.

It will be observed that in each of the three conditions, hepatic abscess, hydatid tumours of the liver, and medullary sarcoma affecting that organ, there is fluctuation on palpitation. The diagnosis of these diseases is therefore a matter of great importance.

In the **Hepatic Abscess** there will probably be the history of previous residence in the tropics, and the

occurrence of severe rigors and vomiting ; the constitutional disturbance is also very great.

The exploring needle will evacuate *pus*.

The **Hydatid Tumour** usually gives rise to only a little local pain, the constitutional disturbance being never well marked.

The exploring needle yields a *thin colourless fluid* in which the echinococci may be found.

In **Medullary Sarcoma** of the liver the constitutional symptoms are well marked, the emaciation is extreme, and the pain severe. The exploring needle will probably evacuate only a *few drops of blood* and a *cancerous juice*, in which may be observed caudate multinucleate cells.

FATTY LIVER.

Fatty disease of the liver is a frequent accompaniment of pulmonary phthisis and fatty disease of other organs, and has been observed in syphilis, and after death from typhus fever, variola, etc. It frequently results from chronic alcoholism.

Symptoms.—The organ is *uniformly* enlarged, and it feels rather soft and smooth. There is no pain or tenderness on pressure in the right hypochondrium or epigastrium. The complexion is pasty, the skin is bloodless, resembling fine polished ivory, and there is constipation or diarrhœa ; hæmorrhoids, and anæmia, and occasionally ascites, may be present. There is no jaundice, no albuminuria, nor dropsy. The symptoms complained of are indeed very indefinite, and are mostly those of uneasiness. The spleen is not usually enlarged.

Pathology.—In the normal condition the liver contains a certain amount of oil, but in this disease the hepatic cells are crammed with oil-globules and their

nuclei are obscured or disappearing. The edges of the liver are round and greasy to the touch, the whole gland being of a pale fawn-colour. The morbid process appears to commence in the circumference exterior to the lobules, and to spread towards their centre. The normal weight of the liver being $4\frac{1}{2}$ lbs., in this condition it may even exceed 12 lbs.

It is a necessarily fatal disease, and may last about two years.

LARDACEOUS LIVER.

The gland may or may not be enlarged, but, when it is so, the enlargement is *uniform*. There is fulness with a feeling of smoothness and hardness in the right hypochondrium, but no tenderness on pressure, accompanied by anæmia, nausea, dyspepsia and flatulence, and sometimes, though rarely, severe pain, ascites and jaundice. The substance of the organ is hard, like wax, giving a brown staining when tincture of iodine is applied to the tissue. The disease is always fatal.

Virchow applied the name 'Amyloid' to this condition from a supposed analogy of the morbid material to starch (*amylum*). It may co-exist with the fatty liver, with cirrhosis or with syphilitic gummata, and is generally observed in connection with carious bones, drainages of pus, etc. The spleen is usually similarly affected and enlarged. The structure of the gland is converted into dense matter, and the abolition of its functions is occasioned by the destruction of the hepatic cells. The minute vessels, especially the arteries, are first affected, the morbid change then extending to the capillaries, and subsequently invading the proper elements of the implicated texture. The cells in the

middle of the lobules are generally first affected, the morbid change then spreading towards the centre of the lobules themselves.

TUBERCLE OF THE LIVER.

Deposits of tubercle are very rare in the liver. They are probably always connected with advanced tuberculosis of other organs, especially of the abdominal viscera. The whole gland may be studded all over with semi-transparent miliary granulations, or with yellow cheesy deposits.

SYPHILITIC LIVER.

In this condition there are yellowish white firm tumours. They are generally observed upon the exterior of the organ and extending inwards. The lardaceous liver is often of syphilitic origin.

INFLAMMATION OF THE BILIARY PASSAGES.

The forms of inflammation to which the gall bladder and biliary ducts are liable are the three following:—

(1) **Catarrhal Inflammation.**—In this form there is an increase of mucous secretion which becomes viscid or muco-purulent. Occasionally a firm plug of mucus may obstruct, for a time, the cystic or common duct. It is generally preceded by catarrh of the stomach and duodenum.

(2) **Plastic or Exudative Inflammation.**—In this there are fibrinous products. Casts of the tubes are found blocking up these channels and causing dilatation.

(3) **Suppurative** Inflammation, in which a thick kind of blood-stained mucus and pus are formed. Ulceration may follow; it is usual to find gall-stones when the gall bladder is ulcerated, but ulceration may be induced by decomposing bile, in the absence of calculi.

Symptoms.—These vary very much. The hepatic ducts are less liable to inflammation than the gall bladder, and than the common and cystic ducts. In the catarrhal form there may be slight tenderness in the right hypochondriac and epigastric regions, with constipation and nausea. If many of the ducts are blocked by viscid mucus there will be jaundice.

The biliary passages may become partially dilated from inflammatory swelling of the mucous membrane, from accumulated bile, from calculi, and from fibrinous or catarrhal exudations. A globular or pear-shaped tumour is sometimes formed, which may contain large quantities of fluid, in consequence of the obstruction allowing the entrance of bile, but preventing its exit.

Treatment.—This must vary according to the symptoms, but amongst the remedies employed may be mentioned fomentations and sedatives, simple salines, ammonia and bark, nitro-hydrochloric acid, Carlsbad water, leeches to the anus or to the liver, calomel and blue pill.

JAUNDICE (jaunir, to become yellow).

ICTERUS (ἰκτερός, a yellow bird).

Although jaundice is, strictly speaking, a symptom, still, since in a great many cases no positive cause for its presence can be assigned, it may be termed a disease *per se*.

Causes.—(1.) **Suppression** of the biliary functions, by

which the blood becomes charged with cholesterine and the colouring matter of the bile.

(2.) **Obstruction** to the bile-flow into the duodenum, the bile, although properly formed, being re-absorbed by the blood. If this condition be of long continuance, suppression may also take place.

Thus jaundice may occur from obstruction of the biliary ducts, either from spasm, atony, or sluggishness of these tubes.

Symptoms.—There is a yellow colour of the skin, especially marked in the conjunctivæ. The stools are of a light colour, like clay, the urine is thick and of a deep red or brownish-black colour, usually loaded with lithates, and giving an iridescent play of colours with strong nitric acid. There is no fever, no thirst, and no pain, but the patient is much depressed. There is usually constipation, but occasionally, though rarely, diarrhœa. The pulse is weak, the appetite bad, the tongue is foul and coated, and itching of the skin is usually very distressing. Giddiness is sometimes complained of, and all objects may appear yellow; in extreme cases the sweat and saliva are yellow. Recovery is the usual termination, but if the disease continues long there may be stupor, delirium, and other signs of cerebral mischief. There is occasionally a tendency to hæmorrhage, such as bleeding from the gums or the nose, purpura, etc.

Although jaundice may arise without any ascertainable cause, and be only a transient affection, yet it must be borne in mind that it is often occasioned by very serious conditions; thus structural disease, or cancer of the liver or pancreas, closure of the ducts from adhesive inflammation of the liver, the presence of gall-stones in the ducts, and the pressure of any tumour, may be

causes of jaundice. Fæcal accumulations and enlargement of the uterus have given rise to this condition, and it has been observed in severe forms of relapsing and intermittent fevers, and, in a mild degree, in pyæmia, typhus fever and pneumonia. In all these instances, however, the jaundice is only a symptom, and in every case of the kind the most careful examination should be made to ascertain the presence of any positive disease, for on the care with which this inquiry is made will the prognosis of each case mainly depend.

If jaundice arise from **Suppression**, only those ingredients of the bile which exist already formed in the blood are found in the urine ; but when it results from obstruction, the matters generated in the liver itself are also found, viz. : the bile acids.

To discriminate between these conditions, about two fluid drachms of urine are generally added to half a drachm of strong sulphuric acid, with a small fragment of loaf sugar. **Obstruction** will be indicated by a **purple or scarlet colour** appearing at the line of contact of the two liquids, and caused by the oxidation of the bile acids. **Suppression** is shown by a mere **browning** of the sugar.

Treatment.—Of simple jaundice without assignable cause. This should consist of mild mercurials, or podophyllin, colocynth, aloes, followed by hydrochloric acid and sulphate of magnesia. Some distinguished authorities, however, recommend alkalies, as potash and soda. When jaundice arises from known causes the treatment must be directed to the removal of the latter.

HEPATIC OR BILIARY COLIC,

Is caused by the passage of a gall-stone from the gall-bladder into the duodenum.

Symptoms.—There is agonising pain in the epigastric and right hypochondriac regions, extending upwards to the right shoulder, usually relieved by pressure, and accompanied by nausea, vomiting, flatus and constipation. Rigors are not uncommon. If the stone recedes into the gall-bladder these symptoms will cease, but if it becomes impacted, dropsy of the gall-bladder may ensue, and the duct become ulcerated or gangrenous. If permanent obstruction takes place the jaundice increases, the liver progressively enlarges, and there is great distension of the gall-bladder. There is great danger of a fatal termination unless the stone be forced into the bowel, or adhesive inflammation be set up, or the stone finds its way through the abdominal parietes, or into the intestine after ulceration and perforation.

The sudden cessation of pain shows that the stone has passed into the duodenum.

If the evacuations be diluted with water, the gall-stones may be seen floating upon their surfaces.

Treatment.—This must be directed to the relief of the spasms by such remedies as opium, chloroform, emetics, the hot bath and fomentations.

GALL-STONES. BILIARY CALCULI.

These stones may vary from the size of a pea to a walnut; in colour they are brown, greenish, or yellowish-brown. They are somewhat greasy to the touch, and of slight consistency.

Their specific gravity is 1027.

Gallstones may sometimes be **simple**, in which case they consist of pure crystallised cholesterine, bile resin, or soap and cholesterine; or they may be **compound**, with nuclei, which are surrounded by a shell, and a rind or crust. In chemical composition the compound biliary calculi consist of cholesterine (70 to 80 per cent.), and biliary colouring matter, sometimes blended with carbonate and phosphate of lime.

Cholesterine is a peculiar substance which exists in solution in healthy bile, but which under certain circumstances becomes released from its solvent and assumes a crystalline form. In all cases the nucleus of the concretion consists of a small piece of solid biliary matter, or of inspissated bile cemented by mucus. Gall-stones are found in one or two states, either *solitary* (oval or globular), or *multiple* (with polished facets from constant friction). They occasion no pain or inconvenience unless the gall-ducts are obstructed, and as many as 300 have been found in a single gall-bladder, no symptom having arisen during life to indicate their presence.

They are rare under the age of twenty-five, and occur with tolerable frequency after forty.

They are more often observed in females than in males in the proportion of 3 : 2.

The formation of gall-stones is favoured by sedentary habits, by tumours pressing upon the biliary passages, catarrh of the ducts or inflammation of the gall-bladder, or any cause tending to compress or obstruct the flow of bile.

HÆMATEMESIS (*ἅμα*, blood, *ἔμεσις*, vomiting).

Definition.—A vomiting of blood.

Symptoms.—Blood is brought up usually in *large* quantities, dark-coloured or *grumous*, and mixed with food. It is *not frothy*. There is nausea with tension at the epigastrium. *Melæna* (discharge of dark-coloured blood from the bowels) is common, and there are symptoms of duodenal or gastric disturbance.

Causes.—Cirrhosis of the liver; congestion and ulcer of the stomach, or the rupture of an aneurismal tumour into the stomach. *Hæmatemesis* may also occur in *purpura*, or be vicarious of menstruation in cases of *amenorrhœa*.

Treatment.—Rest; abstinence from food for some hours, followed by farinaceous diet. When the hæmorrhage is excessive, drinks of iced water or rough ice may be swallowed, or ice should be applied to the pit of the stomach. Mineral and vegetable astringents may then be given, as gallic acid, and diluted sulphuric acid with tincture of opium; and, in fact, the general treatment of hæmorrhage should be adopted. If vicarious of menstruation, leeches may be applied to the vulva or anus. In cases of *purpura*, tonics, quinine and the mineral acids are the most appropriate remedies.

HÆMOPTYSIS (*ἅμα*, blood, *πύσις*, spitting).

Definition.—A spitting of blood.

Symptoms.—The blood is coughed up, either in large or small quantities. It is mixed with the sputa and not with the food, and is of a bright *florid-red* colour, and *frothy*. There is occasionally dyspnœa, with pulmonary or bronchial symptoms, but there is no *melæna*.

Causes.—The following is the order of frequency of the conditions in which hæmoptysis occurs:—(1) Tubercular disease, (2) Vicarious, as in amenorrhœa, (3) In disease of the heart and the rupture of an aneurism, (4) Least in frequency is the hæmoptysis of plastic bronchitis, but spitting of blood may occur in congestion of the lungs, as in pneumonia, or in gangrene of those organs or in pulmonary apoplexy, and in purpura. The blood is sometimes swallowed, and it may then be vomited, in which case it will present the characters of hæmatemesis.

Treatment.—Rest, complete repose, the exhibition of cold liquids and sucking ice; no speaking except in a whisper. Astringents, as mineral acids and acetate of lead with excess of acetic acid in doses of 5 or 6 grains daily, and the treatment of hæmorrhage generally.

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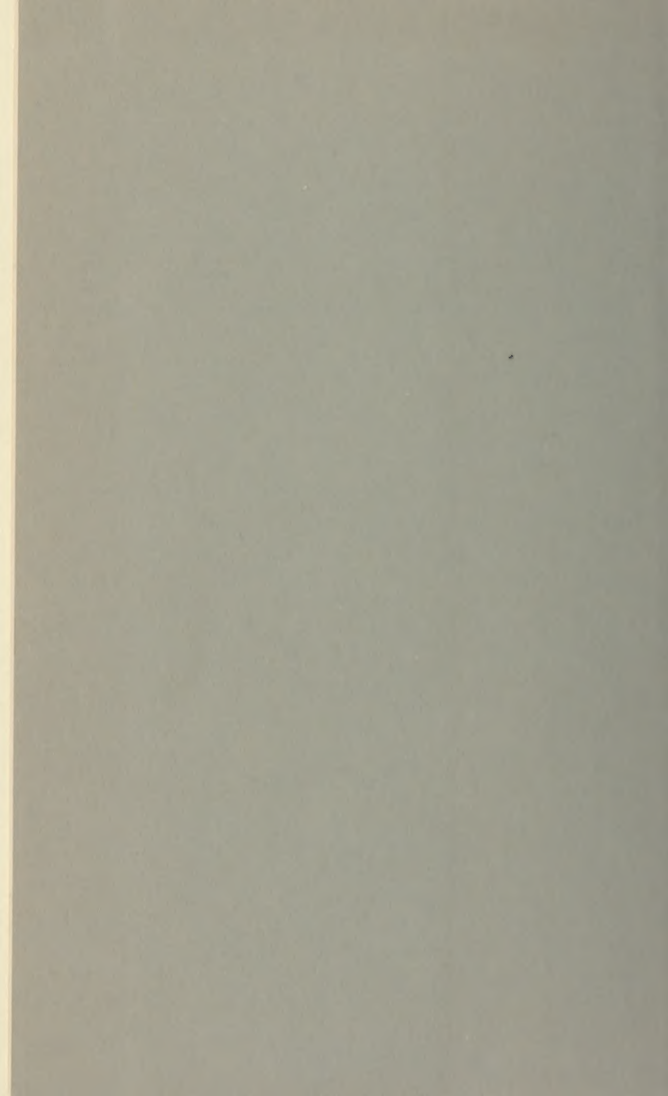
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